2010 Urban Water Management Plan

August 2011

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August 24 2011

Mr. Damien O'Bid, P.E., City Engineer/Public Works Director
City of Cotati
201 West Sierra Avenue
City of Cotati, CA 94931

Subject: 2010 Urban Water Management Plan

Dear Mr. O'Bid:

We are pleased to submit for your use the City of Cotati (City) 2010 Urban Water Management Plan (UWMP). The 2010 UWMP was prepared in accordance with the Urban Water Management Planning Act (UWMPA) of 1983 and subsequent amendments, as well as other applicable regulations. The purpose of the UWMP is to maintain efficient use of urban water supplies, continue to promote conservation programs and policies, ensure that sufficient water supplies are available for future beneficial use, and provide a mechanism for response during water drought conditions.

The report is organized according to the recommended format established by the California Department of Water Resources (DWR) as follows:

Chapter 1 – Plan Preparation
Chapter 2 – System Description
Chapter 3 – System Demands
Chapter 4 – System Supplies
Chapter 5 – Water Supply Reliability and Water Shortage Contingency Planning
Chapter 6 – Demand Management Measures
Chapter 7 – Completed Urban Water Management Plan Checklist

We would like to extend our thanks to you, Mr. Kevin Fredricksen, and other City staff whose courtesy and cooperation were valuable components in completing this plan.

Sincerely,

CAROLLO ENGINEERS, INC.

Thomas S. Kalkman, P.E.
Vice President

Tommy A. Greci, P.E.
Project Manager

TSK/TAG:cjp

Enclosures: 2010 Urban Water Management Plan

2010 URBAN WATER MANAGEMENT PLAN

August 2011

08/24/11

08/24/11

Prepared By

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City of Cotati

2010 URBAN WATER MANAGEMENT PLAN

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Chapter 1

PLAN PREPARATION

1.1 PURPOSE

The California Water Code requires urban water suppliers within the State to prepare and adopt Urban Water Management Plans (UWMPs) for submission to the California Department of Water Resources (DWR). The UWMPs, which must be filed every five years, must satisfy the requirements of the Urban Water Management Planning Act (UWMPA) of 1983, including amendments that have been made to the Act. The UWMPA requires urban water suppliers servicing 3,000 or more connections, or supplying more than 3,000 acre-feet (AF) of water annually, to prepare an UWMP. As of 2010, the City of Cotati (City) supplied roughly 803 AF of water through 2,573 service connections. As such, the City is not legally required to prepare a 2010 UWMP. However, because the City is committed to the efficient use of water, it has opted to prepare this report.

The purpose of the UWMP is to maintain efficient use of urban water supplies, continue to promote conservation programs and policies, ensure that sufficient water supplies are available for future beneficial use, and provide a mechanism for response during water drought conditions. This report, which was prepared in compliance with the California Water Code, and as set forth in the guidelines and format established by the DWR, constitutes the City's 2010 UWMP.

1.2 BACKGROUND

1.2.1 Urban Water Management Planning Act

In 1983, State Assembly Bill (AB) 797 modified the California Water Code Division 6, by creating the UWMPA. Several amendments to the original UWMPA, which were introduced since 1983, have increased the data requirements and planning elements to be included in the 2005 and 2010 UWMPs.

Initial amendments to the UWMPA required that total projected water use be compared to water supply sources over the next 20 years, in 5-year increments. Recent DWR guidelines also suggest projecting through a 25-year planning horizon to maintain a 20-year timeframe until the next UWMP update has been completed.

Other amendments require that UWMPs include provisions for recycled water use, demand management measures (DMMs), and a water shortage contingency plan. The UWMPA requires inclusion of a water shortage contingency plan, which meets the specifications set forth therein. Recycled water was added in the reporting requirements for water usage and figures prominently in the requirements for evaluation of alternative water supplies, when future projections predict the need for additional water supplies. Each urban water purveyor must coordinate the preparation of the water shortage contingency plan with other urban

water purveyors in the area, to the extent practicable. Each water supplier must also describe their water demand management measures that are being implemented, or scheduled for implementation.

Amendments Senate Bill (SB) 610 (Costa, 2001), and AB 901 (Daucher, 2001), which became effective beginning January 1, 2002; require counties and cities to consider information relating to the availability of water to supply new large developments.

Amendment SB 318 (Alpert, 2004) requires the UWMP to describe the opportunities for development of desalinated water, including but not limited to, ocean water, brackish water, and groundwater, as long-term supply. AB 105 (Wiggins, 2004) requires urban water suppliers to submit their UWMPs to the California State Library.

Recent amendments to the UWMPA affecting the preparation of 2010 UWMPs are the result of the enactment of Water Conservation Bill of 2009 and other legislation. The Water Conservation Bill of 2009 was enacted in November 2009 to increase water use efficiency, and requires urban water suppliers to reduce the statewide average per capita daily water consumption by 20 percent by December 31, 2020. Changes to the 2010 UWMP requirements primarily address water conservation and DMMs, but also affect notification, water use projections for lower income housing, grant and loan eligibility criteria, and the distribution of UWMPs.

1.2.2 Previous Urban Water Management Plan

Pursuant to the UWMPA, the City previously prepared an UWMP in 2006, which was approved and adopted by the City Council in November 21, 2006. Because the City is not legally required to complete an UWMP, the City did not submit a copy to the DWR.

This 2010 UWMP report serves as an update to the City's 2006 UWMP.

1.3 COORDINATION WITH APPROPRIATE AGENCIES

The UWMPA requires that the UWMP identify the water agency's coordination with appropriate nearby agencies.

Law

> *10620 (d) (2) Each urban water supplier shall coordinate the preparation of its plan with other appropriate agencies in the area, including other water suppliers that share a common source, water management agencies, and relevant public agencies, to the extent practicable.*

A large majority of the potable water provided to City residential and commercial customers is purchased from the Sonoma County Water Agency (SCWA) on a wholesale basis. The City has coordinated with the SCWA in the development of this UWMP. The City has also coordinated with many other cities and water districts involved in the Restructured Water Supply Agreement with SCWA. While preparing the 2010 UWMP, however, the City

coordinated its efforts with relevant agencies to ensure that the data and issues discussed in the plan are presented accurately. Table 1.1 summarizes how the UWMP preparation was coordinated with different agencies in area. Appendix A contains copies of outreach documents.

Table 1.1 Coordination with Appropriate Agencies (Guidebook Table 1)
2010 Urban Water Management Plan
City of Cotati

Check at least one box on each row	Participated in Developing the Plan	Commented on the Draft	Attended Public Meetings	Was Contacted for Assistance	Was Sent a Copy of the Draft Plan	Was Sent a Notice of Intention to Adopt	Not Involved/ Not Informed
Sonoma County Water Agency	✓	✓	✓	✓	✓	✓	
Sonoma County					✓	✓	
Other Cities					✓	✓	
Other Water Districts					✓	✓	

The City also provided formal written notification to the SCWA that the City's UWMP was being updated for 2010. In accordance with the UWMPA, this notification was provided to SCWA and Sonoma County at least 60 days prior to the public hearing of the plan. Copies of the final UWMP were also provided to Sonoma County and SCWA.

1.4 PLAN ADOPTION, SUBMITTAL AND IMPLEMENTATION

Pursuant to the requirements of the UWMPA, this section summarizes the adoption, submittal, and implementation of the City's 2010 UWMP.

Law

10621 (c). The amendments to, or changes in, the plan shall be adopted and filed in the manner set forth in Article 3 (commencing with Section 10640)

10642. After the hearing, the plan shall be adopted as prepared or as modified after the hearing.

10643. An urban water supplier shall implement its plan adopted pursuant to this chapter in accordance with the schedule set forth in its plan.

10644 (a). An urban water supplier shall submit to the department, the California State Library, and any city or county within which the supplier provides water supplies a copy of its plan no later than 30 days after adoption. Copies of amendments or changes to the plans shall be submitted to the department, the California State Library, and any city or county within which the supplier provides water supplies within 30 days after adoption.

10645. Not later than 30 days after filing a copy of its plan with the department, the urban water supplier and the department shall make the plan available for public review during normal business hours.

1.4.1 Plan Adoption

The City will receive and file the 2010 UWMP.

1.4.2 Plan Submittal

The City's 2010 UWMP was submitted to SCWA for review. Because the City serves fewer than 3,000 connections, it is not required to submit an UWMP to DWR. For this reason, the City has chosen not to submit the 2010 UWMP to DWR at this time.

1.4.3 Plan Implementation

As part of this UWMP, the City intends to implement on-going/future action items. Timelines for the anticipated implementation schedule of specific activities/programs are presented in the body of the report as the activities/programs are discussed.

1.5 REPORT ORGANIZATION

The UWMP contains 7 chapters, followed by appendices that provide supporting documentation for the information presented in the report. The chapters are briefly described below:

- Chapter 1 – Plan Preparation
- Chapter 2 – System Description
- Chapter 3 – System Demands
- Chapter 4 – System Supplies
- Chapter 5 – Water Supply Reliability and Water Shortage Contingency Planning
- Chapter 6 – Demand Management Measures
- Chapter 7 – Completed UWMP Checklist

Additionally, the chapters are preceded by a UWMP Contact Sheet.

1.6 ACKNOWLEDGEMENTS

Carollo Engineers wishes to acknowledge and thank Damien O'Bid and Kevin Fredrickson. Their cooperation and courtesy in obtaining a variety of necessary information were valuable components in completing and producing this report.

1.7 ABBREVIATIONS AND DEFINITIONS

To conserve space and improve readability, the following abbreviations are used in this report. The abbreviations are spelled out in the text the first time the phrase or title is used in each chapter and subsequently identified by abbreviation only.

AB	Assembly Bill
AF	Acre Feet
AFY	Acre Feet per Year
BMP	Best Management Practices
CAGPI	Cotati Area Groundwater Pool Interests
CD	Compact Disc
CEC	Contaminants of Emerging Concern
CII	Commercial, Industrial, Institutional
City	City of Cotati
CUWCC	California Urban Water Conservation Council
DMMs	Demand Management Measures
DWR	California Department of Water Resources
ETo	Evapotranspiration
GPCD	Gallons Per Capita per Day
GPD	Gallons per Day
GWMP	Groundwater Management Plan
Maddaus Report	Maddaus Water Management
MG	Million Gallons
MGD	Million Gallons per Day
MOU	Memorandum of Understanding
NAVD 1988	North American Vertical Datum of 1988
PRV	Pressure Reducing Valve

PSI	Pounds per Square Inch
SB	Senate Bill
SCWA	Sonoma County Water Agency
Sub regional System	Santa Rosa Sub-Regional Sewerage System
SUDP	Specific Urban Development Plant
UFW	Unaccounted-for-water
ULFT	Ultra-Low Flush Toilets
UWMP	Urban Water Management Plan
UWMPA	Urban Water Management Planning Act
VOC	Volatile Organic Compound
WRP	Laguna Water Reclamation Plant

1.8 REFERENCE MATERIAL

The following documents were referenced in the preparation of this UWMP:

- 2005 Sonoma County Water Agency Urban Water Management Plan
- City of Cotati Draft Water Distribution System Master Plan, February 2011, Carollo Engineers.
- City of Cotati 2006 Urban Water Management Plan, November 2006, Winzler and Kelly.
- Department of Water Resources California Groundwater Bulletin 118 (Updated 2004)
- Draft 2010 Sonoma County Water Agency Urban Water Management Plan
- Final 2010 Urban Water Management Plan Water Demand Analysis and Water Conservation Measures Update, November 2010, Maddaus Water Management.
- Restructured Agreement for Water Supply, May 2006, Sonoma County Water Agency.

SYSTEM DESCRIPTION

The Urban Water Management Planning Act (UWMPA) requires that the Urban Water Management Plan (UWMP) include a description of the water purveyor's service area and various aspects of the area served including climate, population, and other demographic factors.

Law

> *10631. A plan shall be adopted in accordance with this chapter and shall do all of the following:*
>
> *10631. (a) Describe the service area of the supplier, including current and projected population, climate, and other demographic factors affecting the supplier's water management planning. The projected population estimates shall be based upon data from the state, regional, or local service agency population projections within the service area of the urban water supplier and shall be in five-year increments to 20 years or as far as data is available.*

2.1 SERVICE AREA PHYSICAL DESCRIPTION

This section provides a description of the City of Cotati (City) service area, including land use designations and climate characteristics.

2.1.1 Location and Service Area Boundaries

The City is located in Sonoma County, about 45 miles north of San Francisco in the U.S. 101 corridor between Rohnert Park and Petaluma. Figure 2.1 shows the location of the City relative to other metropolitan areas in northern California. Cotati has long been considered the "Hub" of Sonoma County by virtue of its central location and its distinct and historic hexagonal plaza. The City's residents enjoy the benefits of living in a small city, as well as the cultural advantages of being located near major urban centers[1].

According to City staff, growth within the next 25 years is expected to primarily occur within the current City limits. Therefore, the water service area boundary and the current City limits are coterminous and will be used interchangeably throughout this report. Figure 2.2 shows the service area boundary, which is roughly bounded by the City of Rohnert Park to the north and east and unincorporated areas of Sonoma County to the south and west.

2.1.2 Land Use

Land use and population information are integral components in determining the amount of water demand within the City. The type of land use in an area will affect the volume and

[1] http://www.ci.cotati.ca.us/

Figure 2.1
Location Map
2010 Urban Water Management Plan
City of Cotati

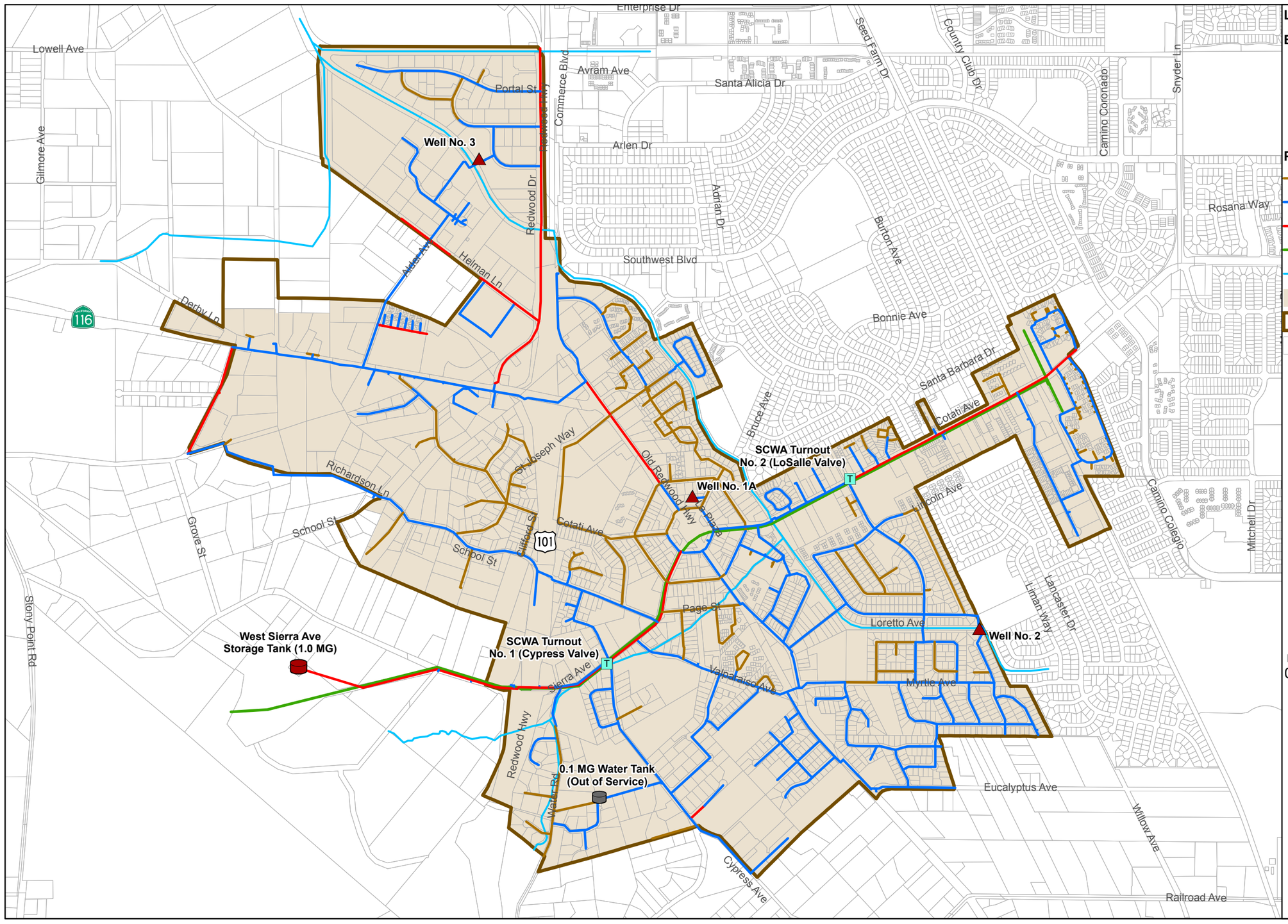


Figure 2.2
Water Service Area
2010 Urban Water Management Plan
City of Cotati

character of the water demand. Adequately estimating the demand of water from various land use types is important in sizing and maintaining effective water system facilities.

The City's current General Plan was adopted in 1998. The City is currently in the process of updating the General Plan. According to City staff, the land use assumptions that will be incorporated into the General Plan Update will be based on the City's current zoning map. For this reason, the land use assumptions presented in this section are consistent with the City's current zoning map (Figure 2.3).

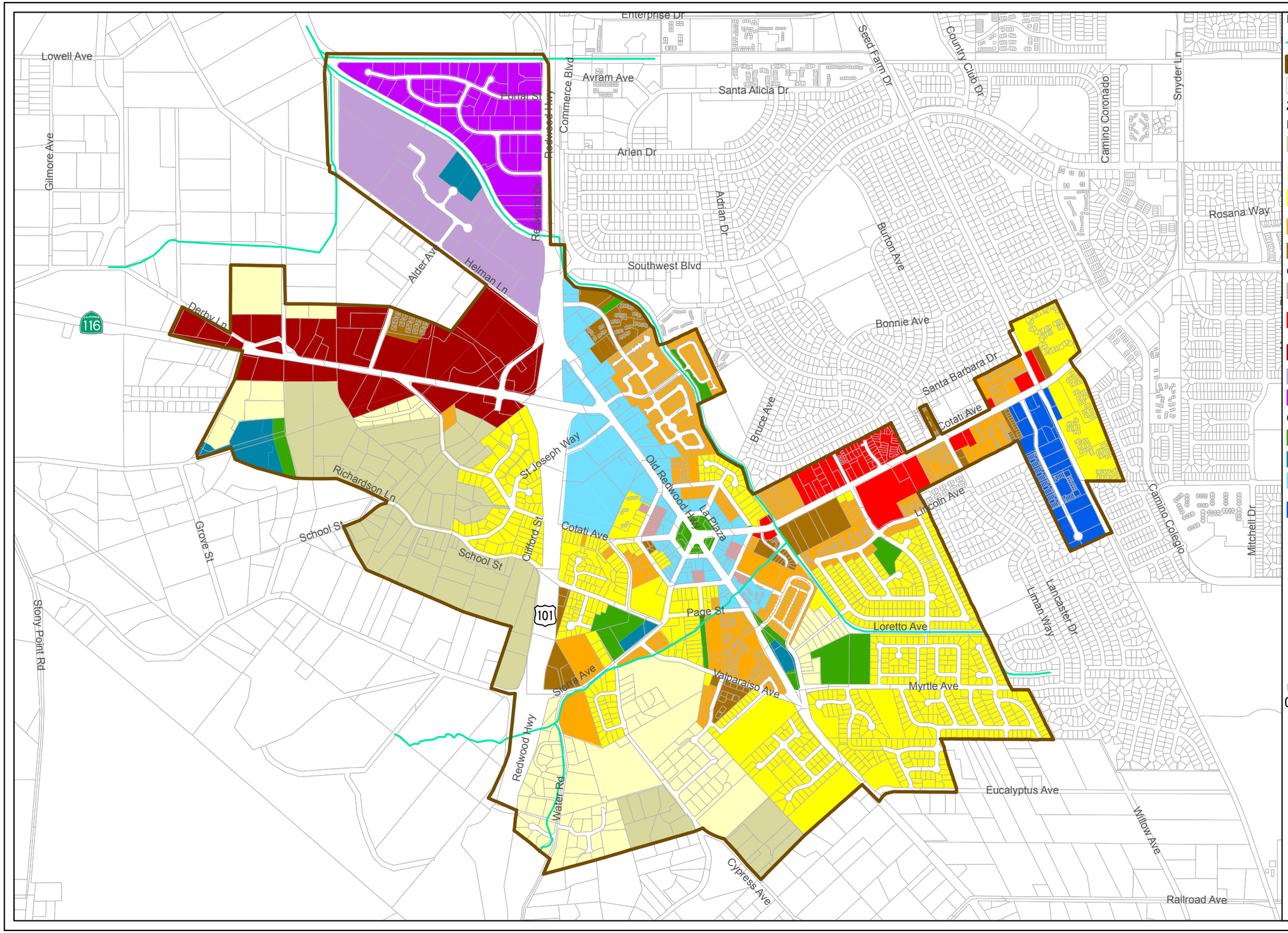
The City provides water service to residents, businesses, and other institutions within the study area. Table 2.1 provides the acreage totals by zoning classification within the City limits, and a breakdown between developed land and undeveloped lands.

Table 2.1 Study Area Zoning Designations
2010 Urban Water Management Plan
City of Cotati

Zoning Designation	Area within the Current City Limits[(1)]		
	Total (acres)	**Developed (acres)**	**Undeveloped (acres)**
CD - Downtown Commercial	3.31	1.23	2.08
CE - Commercial, East Cotati Corridor	27.90	26.14	1.76
CG - Commercial, Gravenstein Corridor	85.17	25.41	59.76
CI - Commercial/Industrial District	64.02	19.06	44.96
IG - General Industrial District	53.56	52.23	1.33
NL - Neighborhood, Low Density	231.41	193.51	37.9
NM - Neighborhood, Medium Density	99.98	89.01	10.97
NU - Neighborhood, Urban	34.79	27.80	6.99
OSR - Open Space - Recreation	26.48	25.16	1.32
PF - Public Facility District	15.45	10.71	4.74
RR - Rural Residential	98.63	78.00	20.63
RVL - Residential Very Low Density	117.38	69.86	47.52
SPD - Specific Plan, Downtown	62.30	28.04	34.26
SPSW - Specific Plan, Santero Way	20.55	6.29	14.26
Total	**940.94**	**652.44**	**288.5**

Note:
(1) Area totals exclude roads, highways, waterways, etc.

The largest zoning category is residential (neighborhood, low density; neighborhood, medium density; neighborhood, urban; rural residential; and residential very low density), which accounts for approximately 1,758 acres, or approximately 62 percent of the acreage within the City limits, excluding streets, highways, waterways, etc. Commercial and industrial zoning (downtown commercial; commercial, East Cotati corridor; commercial Gravenstein corridor;



Legend

- Waterway
- City Limits
- Parcels

Zoning

Residential

- RR - Rural Residential
- RVL - Residential Very Low Density
- NL - Neighborhood, Low Density
- NM - Neighborhood, Medium Density
- NU - Neighborhood, Urban

Commercial/Industrial

- CD - Downtown Commercial
- CE - Commercial, East Cotati Corridor
- CG - Commercial, Gravenstein Corridor
- CI - Commercial/Industrial District
- IG - General Industrial District

Other

- OSR - Open Space/Recreation
- PF - Public Facility District
- SPD - Specific Plan, Downtown
- SPSW - Specific Plan, Santero Way

N

0 1,100 2,200 Feet

Figure 2.3
Cotati Zoning Map
2010 Urban Water Management Plan
City of Cotati

carollo

commercial/industrial district; and general industrial district) make up approximately 25 percent of the total.

Other land uses such as open space - recreation, public facility district, and specific plans (specific plan, downtown and specific plan, Santero Way) account for the remaining 13 percent of the City limits, excluding streets, highways, and waterways.

As previously noted, the City is not anticipating that it will annex additional land areas beyond the current City limits within the planning period of this Master Plan. For this reason, land use assumptions in this study do not extend beyond the current City limits. As shown in Table 2.1, there is roughly 290 acres of developable land within the current City limits. Future water demands in this Master Plan assume that the 290 acres of developable land within City limits will develop by year 2035.

2.1.3 Service Area Climate

The City's study area is characterized by a Mediterranean-type climate with wet, cold winters, and warm, dry summers. Approximately 95 percent of the annual rainfall occurs between November and April, with an average annual rainfall of 30.18 inches[2]. The study area elevation ranges from about 93 feet above mean sea level (msl) on the northwest side of the City, to 272 feet msl on the southwest side of the City.

Table 2.2 summarizes the standard monthly average evapotranspiration (ETo) rates, rainfall, and temperature. Monthly average annual rainfall and ETo are approximately 30.18 inches and 44.37 inches respectively. The City's average monthly temperature ranges from 44.9 to 70.4 degrees Fahrenheit (°F), with an annual mean temperature of 57.6°F. Figure 2.4 shows graphically the precipitation and temperature relationship.

2.2 HISTORICAL AND FUTURE POPULATION

In order to retain its distinct character, preserve its name, and guide its future growth, Cotati incorporated in 1963[3]. The City's roots are steeped in agriculture and music, and its citizens are proud of the diverse and charming community that has been shaped through its history.

According to California Department of Finance population estimates, between 1970 and 2005, the City's population grew by roughly 5,816 residents, from 1,368 in 1970, to 7,184 residents in 2005. Over these 35 years, that growth equated to an annual rate of about 4.9 percent on average.

[2] Source: CIMIS Database, Santa Rosa Station 83 (period of record: 1990 – 2010). http://wwwcimis.water.ca.gov

[3] http://www.ci.cotati.ca.us/

Table 2.2 Climate Characteristics 2010 Urban Water Management Plan City of Cotati			
Month	**Average ETo (inches)**	**Avg. Rainfall (inches)**	**Monthly Average Temperature (°F)**
January	1.04	6.25	47
February	1.6	5.32	50.5
March	3.18	4.09	52.8
April	4.35	2.06	55.8
May	5.48	0.97	59.8
June	6.19	0.26	64.6
July	6.44	0.03	66.5
August	5.86	0.08	66.6
September	4.54	0.38	65.9
October	3.18	1.6	61.2
November	1.54	3.64	53.3
December	0.97	5.5	47.6
Annual	44.37	30.18	57.6

Note:
(1) Source: CIMIS Database, Santa Rosa Station 83 (Period of Record 1990-2010) http://wwwcimis.water.ca.gov.

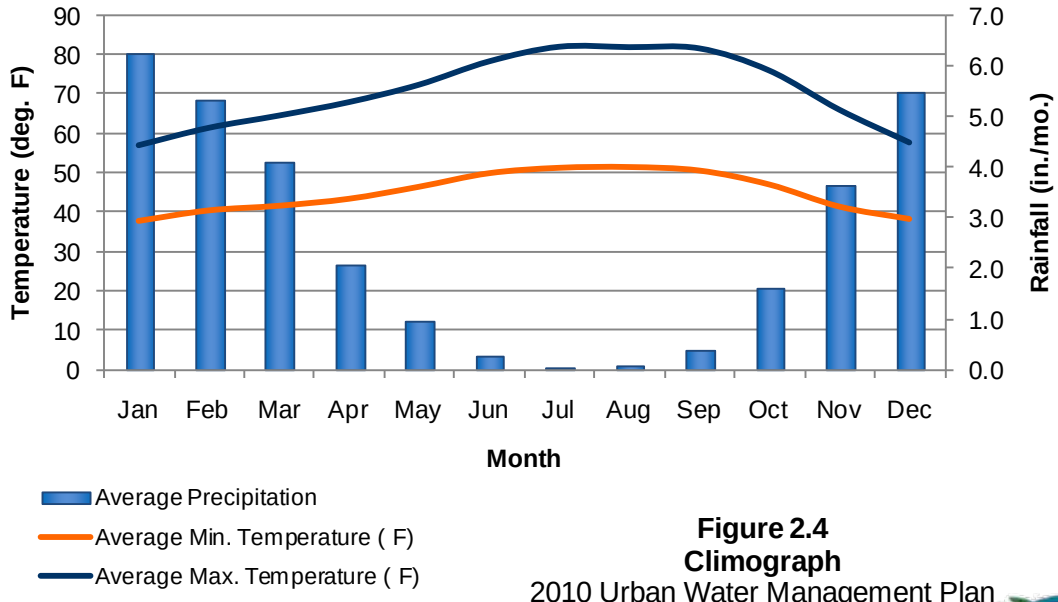


Figure 2.4
Climograph
2010 Urban Water Management Plan
City of Cotati

Population projections used in this 2010 UWMP are based on forecasts provided in the City's Urban Water Management Plan Water Demand Analysis and Water Conservation Measures Update, dated November 2010 (Maddaus Report). A copy of the Maddaus Report is provided in Appendix B for reference. The population forecasts presented in the Maddaus Report project that the City will reach a population of approximately 9,889 people by 2035. Table 2.3 and Figure 2.5 summarize the City's historical and projected population to year 2035.

2.3 EXPANSION PROJECTS

The UWMPA requires that the UWMP identify the major developments within the agency's service area that would require water supply planning.

Law

10910. (a) Any city or county that determines that a project, as defined in section 10912, is subject to the California Environmental Quality…

10912. For the purpose of this part, the following terms have the following meanings:

10912 (a) "Project" means any of the following:

(1) A proposed residential development of more than 500 dwelling units.

(2) A proposed shopping center or business establishment employing more than 1,000 persons or having more than 500,000 square feet of floor space.

(3) A proposed commercial office building employing more than 1,000 persons or having more than 250,000 square feet of floor space.

(4) A proposed hotel or motel, or both, having more than 500 rooms.

(5) A proposed industrial, manufacturing or processing plant, or industrial park planned to house more than 1,000 persons, occupying more than 40 acres of land, or having more than 650,000 square feet of floor area.

(6) A mixed-use project that includes one or more of the projects specified in this subdivision.

(7) *A project that would demand an amount of water equivalent to, or greater than, the amount of water required by a 500 dwelling unit project.*

Although the City is not currently considering any large expansion projects that would need to be accounted for in this UWMP, the city plans to implement the redevelopment plans included in the downtown specific plan. The downtown specific plan has provisions to revitalize the downtown area (Appendix G).

Table 2.3	Historical and Projected Population (Guidebook Table 2) 2010 Urban Water Management Plan City of Cotati		
Year	**Population [1]**	**Year**	**Population [1],[2]**
1970	1,368	2005	7,185
1975	2,870	2010	7,711
1980	3,346	2015	8,105
1985	4,030	2020	8,518
1990	5,714	2025	8,953
1995	6,332	2030	9,409
2000	6,471	2035	9,889

Notes:
(1) Historical population based on California Department of Finance estimates for the City of Cotati.
(2) Population projections provided in the City of Cotati Urban Water Management Plan Water Demand Analysis and Water Conservation Measures Update, Maddaus, November 2010.

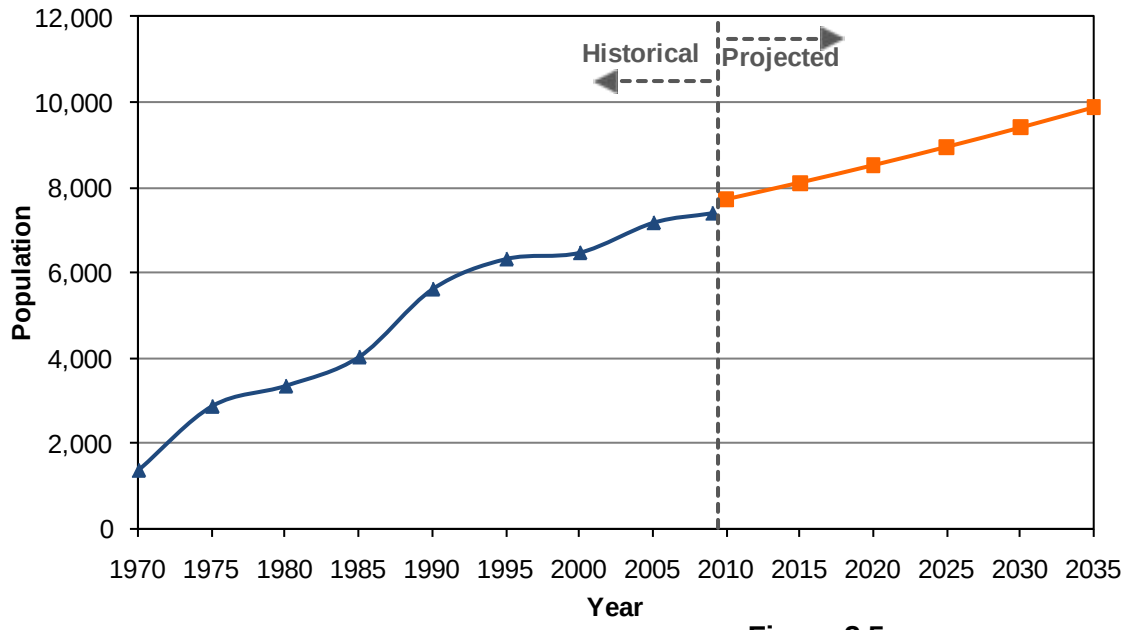


Figure 2.5
Historical and Projected Population
2010 Urban Water Management Plan
City of Cotati

SYSTEM DEMANDS

This section describes the baseline (base daily per capita) water use, the interim and urban water use targets, water system demands, water demand projections, and the water use reduction plan.

3.1 BASELINES AND TARGETS

The Urban Water Management Planning Act (UWMPA) requires that the Urban Water Management Plan (UWMP) identify the baseline water demand, urban water use target, and interim urban water use target for the City of Cotati (City).

Law

> *10608.20 (e) (1) An urban retail water supplier shall include in its urban water management plan…due in 2010 the baseline daily per capita water use, urban water use target, interim urban water use target, and compliance daily per capita water use, along with the bases for determining those estimates, including references to supporting data.*

The base daily per capita use is the first step in determining the City's various urban water use targets over the planning horizon. The current per capita use sets the "baseline" from which the urban and interim water use targets are determined. These targets are used to judge compliance with the 2020 water use reductions set forth in the Senate Bill (SB) x7-7 enacted in November 2009. It should be noted that although the City is highly involved in efforts with water conservation, the City is not legally required to be in compliance with SB x7-7.

3.1.1 Baseline Water Use

The first step in developing the baseline water use for the City is determining the applicable range and years for which the baseline average will be calculated. The UWMPA stipulates an agency may use either a 10 or 15-year average to determine their baseline. If 10 percent of total water deliveries in 2008 were from recycled water, then the agency can use a 15-year average baseline. Since the City had no recycled water deliveries in 2008, a 10-year average was used for baseline determination. In addition to the 10-year baseline, a 5-year baseline is also calculated, which will be used to establish the minimum criteria for the City's use reduction targets. A summary of the 2008 total and recycled water deliveries, 10-year baseline range, and 5-year baseline range is included in Table 3.1.

The data used to calculate the 10-year baseline is included in Table 3.2. The UWMPA requires a continuous range with the end of the range ending between December 31, 2004 and December 31, 2010 be used for baseline determination. As shown in Table 3.1, the City's selected 10-year base period begins in year 1996 and ends in year 2005.

Table 3.1	Base Daily Per Capita Ranges (Guidebook Table 13) 2010 Urban Water Management Plan City of Cotati		
Base	**Parameter**	**Value**	**Units**
10 to 15-Year Base Period	2008 total water deliveries[(1)]	1,047	AFY
	2008 total volume of delivered recycled water	0	AFY
	2008 recycled water as a percent of total deliveries	0	Percent
	Number of years in base period	10	Years
	Year beginning base period range	1996	
	Year ending base period range	2005	
5-Year Base Period	Number of years in base period	5	Years
	Year beginning base period range	2003	
	Year ending base period range	2007	

Note:
(1) Source: City production and consumption data.

Table 3.2	Base Daily Per Capita Water Use – 10-Year Range (Guidebook Table 14) 2010 Urban Water Management Plan City of Cotati			
Base Period Year		**Distribution System Population [(1)]**	**Daily System Gross Water Use [(2)] (mgd)**	**Annual Daily Per Capita Water Use (gpcd)**
Sequence	**Calendar Year**			
1	1996	6,327	0.98	155
2	1997	6,345	1.06	167
3	1998	6,417	0.96	150
4	1999	6,487	0.98	152
5	2000	6,471	1.11	171
6	2001	6,497	1.10	170
7	2002	6,701	1.10	164
8	2003	6,736	1.06	158
9	2004	6,926	1.07	155
10	2005	7,185	1.00	139
		Base Daily Per Capita Water Use		**158**

Notes:
(1) Source: 1990-2000 and 2001-2010 Department of Finance.
(2) Source: City production and consumption data. Based on calendar year.

The California Department of Water Resources (DWR) allows agencies that meet certain criteria to deduct certain types of water use, such as recycled water use, industrial process water, and agricultural water. The City does not meet these criteria for deductions of the per capita water use. However, DWR allows that agencies may revise their per capita water use targets in the 2015 round of UWMPs.

The data used to calculate the 5-year baseline is included in Table 3.3. The UWMPA requires a continuous range with the end of the range ending between December 31, 2007 and December 31, 2010 be used for baseline determination. As shown in Table 3.3, the City's selected 5-year base period begins in year 2003 and ends in year 2007. A summary of the two baseline periods and historical water use are shown on Figure 3.1.

Table 3.3 Base Daily Per Capita Water Use: 5-Year Range (Guidebook Table 15)
2010 Urban Water Management Plan
City of Cotati

Base Period Year		Distribution System Population[1]	Daily System Gross Water Use (mgd)[2]	Annual Daily Per Capita Water Use (gpcd)
Sequence	Calendar Year			
1	2003	6,736	1.06	157
2	2004	6,926	1.07	155
3	2005	7,185	1.00	139
4	2006	7,230	1.00	138
5	2007	7,375	1.02	139
		Base Daily Per Capita Water Use		**146**

Notes:
(1) Source: 1990-2000 and 2001-2010 Department of Finance.
(2) Source: City production and consumption data. Based on calendar year.

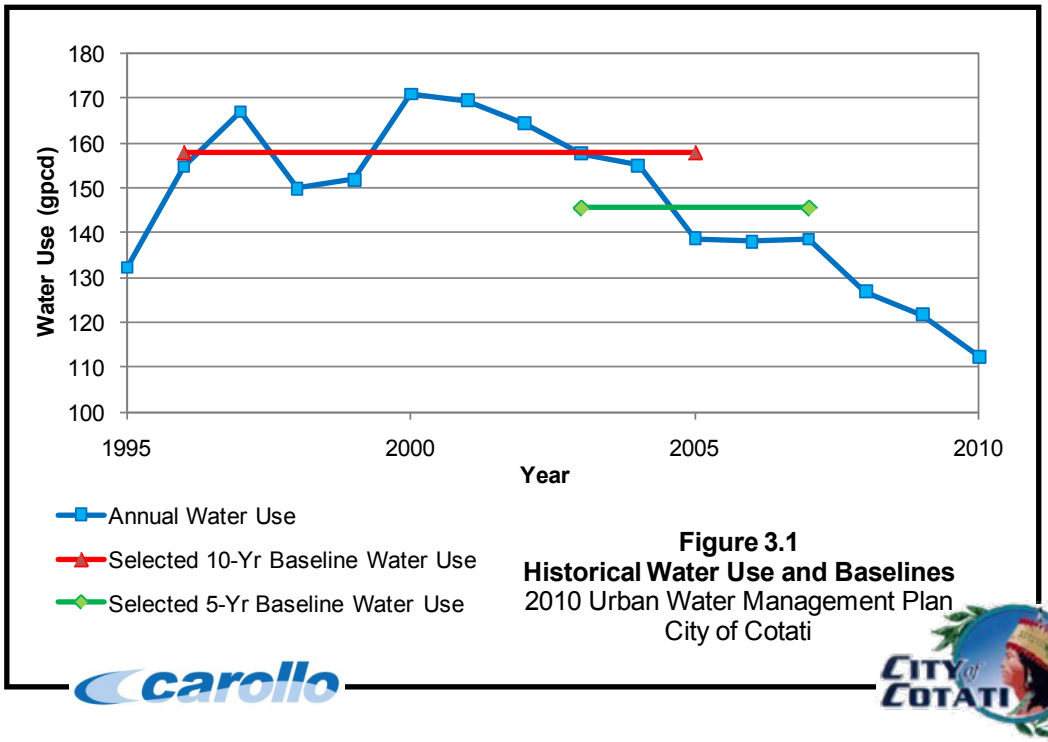


Figure 3.1
Historical Water Use and Baselines
2010 Urban Water Management Plan
City of Cotati

3.1.2 Reduction Targets

The Water Conservation Act of 2009 (SBx7-7) is the new law governing water conservation in California that was enacted November 2009. This law requires that water suppliers

increase water use efficiency with the overall goal to decrease per-capita consumption within the state by 20 percent. The bill required DWR to develop certain criteria, methods, and standard reporting forms through a public process that can be used by water suppliers to establish their baseline water use and determine their water conservation targets (the UWMPA requires urban water suppliers to determine the urban and interim water use targets for 2020 and 2015, respectively). Four target methods have been developed, and identify the specific steps water suppliers shall follow to establish these targets. A brief description of each method, as well as the water use calculated using each methodology is included below. It should be noted that although the targets presented in this section were developed in accordance with the SBx7-7 requirements, the City is not legally obligated to comply with the calculated reduction target, because the City serves fewer than 3,000 connections.

3.1.2.1 Method 1 – 80 Percent of Base Daily Per Capita Water Use

The 2020 water conservation target for Method 1 is defined as a 20 percent reduction of the average per-capita demand for the 10-year continuous baseline period. Based on the daily per capita use of 158 gallons per capita per day (gpcd) determined previously (Table 3.2), the target used for Method 1 is 126 gpcd. The 2015 interim water use target for Method 1 is simply the midpoint of the baseline and the 2020 water conservation target, or 142 gpcd in the City's case.

3.1.2.2 Method 2 – Efficiency Standard Method

Method 2 requires water suppliers to use baseline commercial, industrial, institutional (CII), indoor residential and landscaped area water use to calculate a water use target. Very few agencies in the State have the data required to determine a target using Method 2. For this reason, it is not feasible for the City to use this methodology. Specifically, the City lacks the detailed landscaped area estimates to calculate the landscaped area water use.

3.1.2.3 Method 3 –Hydrologic Region Method

Method 3 requires water suppliers to use the hydrologic region target[1] to calculate a water use target for 2020. A map showing the California hydrologic regions and 2020 conservation goals is included in the final Guidebook to Assist Urban Water Suppliers to prepare a 2010 Urban Water Management Plan. In order to determine the target using Method 3, 95 percent of the region-specific conservation goal is calculated. Based on a target of 137 gpcd for the North Coast hydrologic region, the Method 3 target is 130 gpcd for 2020. The City's 2015 interim target water use for Method 3 is then calculated to be 144 gpcd.

3.1.2.4 Method 4 – BMP Based Method

Method 4 identifies water savings obtained through identified practices and subtracts them from the base daily per capita water use value identified for the water supplier. Per

[1] March 2011, Final - Guidebook to Assist Urban Water Suppliers to Prepare a 2010 UWMP

Methodology 2, baseline per capita calculations use the entire service area population. The water savings identified that can be used to reduce the base daily per capita water use value include:

- Residential Indoor savings,
- Commercial, industrial, and institutional (CII) savings,
- Landscape and water loss savings, and
- Metered savings.

A discussion of each of these components, and the calculated savings is included below.

- **Residential Indoor Savings**. Since indoor and outdoor water use is delivered through a single meter, an assumption of 70 gpcd has been provided by DWR for standard residential indoor water use. To determine indoor residential savings, the method outlines two approaches. First, a best management practices (BMP) calculator has been developed to sum the savings for four conservation elements including single and multi-family residential housing toilets, residential washers, and showerheads. Due to insufficient data on the implementation of these water-saving measures, it will not be discussed further or used to assess indoor residential savings for the City. Therefore, the City will use what has been termed the "default option" to determine these savings. Based on the method, this default value is 15 gpcd.
- **Commercial, Industrial, and Institutional Savings.** Baseline CII water can be easily established for the City since all commercial, industrial, and institutional connections are metered. City yearly meter data from 1996 to 2005 was used to determine CII water use. Water use data was then divided by the population of the corresponding year to determine the per capita water use for each year. The CII water use for the savings calculation is based on a 10-year average CII per capita water use, which is 26.3 gpcd. The method estimates a 10 percent reduction in water use from the 10-year average baseline CII water use, which produces a CII water savings of 2.63 gpcd.

  Landscape and Water Loss Savings. The landscape and water loss water use is determined by subtracting the default indoor water use of 70 gpcd and CII water use of 26.3 gpcd from the calculated base line per capita use. Based on a 10-year baseline per capita water use of 158 gpcd, the landscape and water loss use is 61.5 gpcd.

  The method estimates a default value for landscape and water loss savings of 21.6 percent. The landscape and water loss savings are therefore 13.3 gpcd.
- **Metered Savings.** The City currently meters all users on the water system and therefore this calculation does not supply any savings.

A summary of the Method 4 water use target calculation procedure is shown on Figure 3.2. The City's 2020 target water use is calculated as the baseline water use minus the total

savings (residential indoor, CII, landscape and water loss, and meter savings). A summary of the 10-year baseline water use by sector and individual savings calculated using Method 4 is included in Table 3.4.

Table 3.4 Method 4 Target Determination Summary
2010 Urban Water Management Plan
City of Cotati

	Per Capita Water Use (gpcd)
Baseline Water Use	
Residential Indoor(1)	70
CII(2)	26.3
Landscape/Water Loss[3]	61.5
Total	158
Water Savings	
Residential Indoor(4)	15
CII(5)	2.6
Landscape/Water Loss(6)	13.3
Metered Savings(7)	N/A
Total	31
Method 4 2020 Target Water Use	**127**

Notes:
(1) Standard value based on guidelines in provisional Method 4.
(2) CII= 10 year average City water use for CII water divided by baseline population per Methodology 7 in the guidebook.
(3) Landscape/Water Loss = Total Baseline Water Use - Residential Indoor Water Use - CII Water Use.
(4) Standard value based on guidelines in draft provisional Method 4.
(5) CII water savings of 10 percent based on guidelines in provisional Method 4.
(6) Landscape/water loss savings of 21.6 percent based on guidelines in provisional Method 4.
(7) Metered savings of 20 percent based on guidelines in provisional Method 4.

3.1.2.5 Minimum Water Use Reduction Requirement

The final step in determining the applicability of the water use target for the City is to confirm the water use targets meet the minimum reduction requirements as defined by DWR.

To confirm that the water use target meets the minimum criteria, the 5-year average baseline previously determined (Table 3.3) is used. The chosen 2020 use target must fall below 95 percent of the 5-year baseline (146 gpcd), which for the City is 139 gpcd.

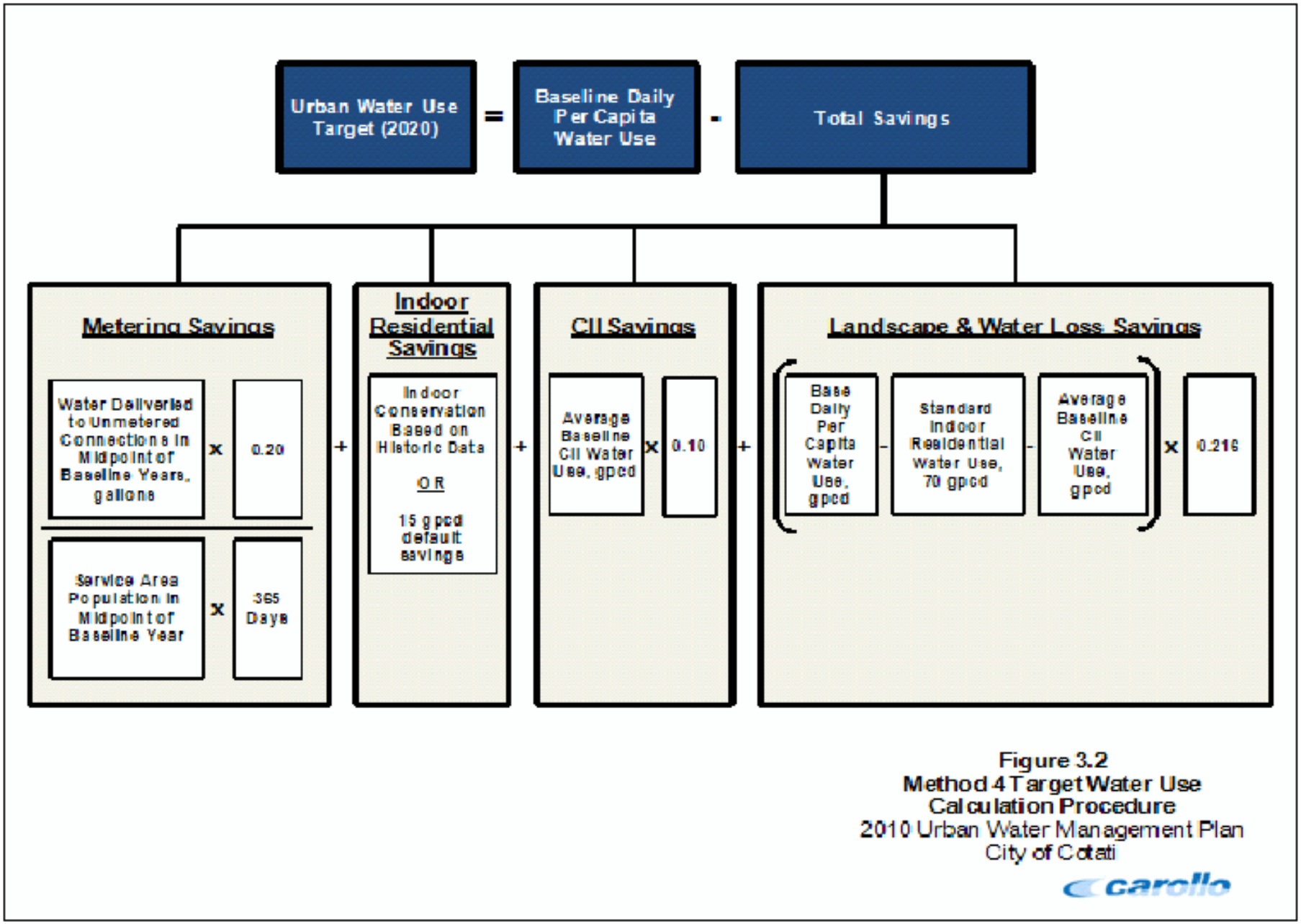


Figure 3.2
Method 4 Target Water Use Calculation Procedure
2010 Urban Water Management Plan
City of Cotati

carollo

3.1.3 Summary of Baselines and Targets

Based on the water use targets calculated using the developed methodology, the City's water use target for 2020 is 130 gpcd. Based on the 10-year baseline of 158 gpcd, the 2015 interim water use target is 144 gpcd. This target was determined using Method 3, which corresponds to 95 percent of the region-specific conservation goal. According to the DWR guidelines, this target is valid since it is less than the target confirmation criteria of 139 gpcd (refer to Section 3. 1.2.5). A summary of the various baselines, use target determined based on various methodologies, and the final use target and interim target are summarized in Table 3.5.

Table 3.5 Baseline and Targets Summary
2010 Urban Water Management Plan
City of Cotati

Baselines (gpcd)		Target Determination Methods (gpcd)				Minimum Reduction Requirement[7] (gpcd)	Target[8] (gpcd)	Interim Target[9] (gpcd)
10-Year[1]	5-Year[2]	1[3]	2[4]	3[5]	4[6]			
158	146	126	NA	130	127	139	130	144

Notes:
(1) Source: 1996 through 2005 City Water System Data Sheet.
(2) Source: 2003 through 2007 City Water System Data Sheets.
(3) Method 1 – 80 percent of the 10-year base daily per capita water use (0.80*158 gpcd).
(4) Method 2 – Performance Standards. Insufficient landscaped area data is available to determine an Urban Water Use Target using Method 2.
(5) Method 3 – 95 percent of the Regional Target (0.95*137 gpcd).
(6) Method 4 –Target method 4 Savings by water sector.
(7) Minimum criterion for the Urban Water Use Target is defined as the 95 percent of the 5-year base daily per capita water use (0.95*146 gpcd).
(8) Urban Water Use Target determined using Method 3.
(9) Interim Urban Water Use Target defined as the average of the 10-year base per capita water use and Urban Water Use Target.

3.2 WATER DEMANDS

The City relies on a mixture of wholesale water purchased from the Sonoma County Water Agency (SCWA) and local groundwater to meet its customer demands. This section summarizes the City's historical water use, including consumption and production per capita water use, seasonal water use and peaking factors.

Law

10631 (e) (1) Quantify, to the extent records are available, past and current water use, and projected water use (over the same five-year increments described in subdivision (a)), identifying the uses among water use sectors including, but not necessarily limited to, all of the- following uses: (A) Single-family residential; (B) Multifamily; (C) Commercial; (D) Industrial; (E) Institutional and governmental; (F) Landscape; (G) Sales to other agencies; (H) Saline water intrusion barriers, groundwater recharge, or conjunctive use, or any combination thereof; and (I) Agricultural.

(2) The water use projections shall be in the same 5-year increments to 20 years or as far as data is available.

10631.1 (a) The water use projections required by Section 10631 shall include projected water use for single-family and multi-family residential housing needed for lower income households, as defined in section 50079.5 of the Health and Safety Code, as identified in the housing element of any city, county, or city and county in the service area of the supplier.

3.2.1 Historical Production and Consumption

Table 3.6 lists the City's historical water consumption and production from 1995 through 2010. During this time period, the City's annual average consumption ranged from 0.72 million gallons per day (mgd) in 2010 to 0.96 mgd in 2001, while the City's annual average production ranged from 0.84 mgd in 1995 to 1.10 mgd in 2000.

Table 3.6 also summarizes the City's unaccounted-for-water (UFW) from 1995 through 2010, which was computed by subtracting the total annual consumption by the total annual production. As a percentage of total production, the City's UFW ranged from a low of roughly three percent in 1995 to a high of 16 percent in 2000. UFW accounts for roughly 10 percent or less of the total demand in a typical water system in California. UFW can be caused by a number of factors, such as leakage, meter inaccuracies, authorized unmetered use (e.g., hydrant flushing, tank cleaning, other maintenance activities, fire fighting exercises, etc.), unauthorized or illegal water use, and/or other factors.

The City's UFW accounted for ten percent or more of the City's total production in ten of the 15 years of historical data shown on Table 3.6. The City has not identified the cause of the high rate of UFW in the water distribution system. In 2003, the City hired a professional leak detection survey company to conduct a Citywide leak detection survey. Only minor leaks were found, which did not explain the UFW. The City believes there is a potential reduce its overall water demand through the identification of UFW sources in the distribution system.

Table 3.6 Historical Water Production and Consumption
2010 Urban Water Management Plan
City of Cotati

		Consumption[2]		Production (SCWA + Groundwater)[2]					Unaccounted-for-Water[3]	
Year	Population[1]	Annual Total (MG)	Daily Average (mgd)	Annual Total (MG)	Average Day Demand (mgd)	Per Capita Demand (gpcd)	Maximum Month Demand (mgd)	Maximum Month: Average Day Ratio	Annual Total (MG)	Percentage of Production[3] (%)
1995	6,332	297.5	0.81	305.8	0.84	132	1.44	1.72	8.3	3
1996	6,327	323.5	0.88	357.4	0.98	154	1.56	1.60	33.9	9
1997	6,345	338.2	0.93	386.9	1.06	167	1.69	1.60	48.7	13
1998	6,417	315.4	0.86	351.2	0.96	150	1.63	1.70	35.8	10
1999	6,487	337.4	0.92	359.5	0.98	152	1.62	1.64	22.1	6
2000	6,471	339.6	0.93	403.7	1.10	170	1.56	1.42	64.1	16
2001	6,497	352.2	0.96	402.0	1.10	170	1.67	1.51	49.8	12
2002	6,701	341.8	0.94	402.0	1.10	164	1.87	1.69	60.3	15
2003	6,736	327.8	0.90	387.6	1.06	158	1.64	1.54	59.8	15
2004	6,926	342.3	0.94	392.0	1.07	155	1.73	1.61	49.7	13
2005	7,185	313.8	0.86	363.7	1.00	139	1.73	1.74	50.0	14
2006	7,230	338.5	0.93	364.2	1.00	138	1.63	1.63	25.7	7
2007	7,375	328.5	0.90	372.9	1.02	139	1.56	1.53	44.4	12
2008	7,388	335.9	0.92	342.3	0.94	127	1.36	1.46	6.4	2
2009	7,418	280.8	0.77	329.8	0.90	122	1.37	1.51	48.9	15
2010	7,711	261.5	0.72	306.7	0.84	112	1.34	1.59	45.2	15
Average						**149**		**1.59**		**11**

Notes:
(1) Source: California Department of Finance Estimates for the City of Cotati.
(2) Source: Historic City Production and Consumption Data.
(3) Unaccounted-for-Water = Production - Consumption. Percentage is presented relative to production.

Water demands served by the City are primarily residential, multi-family, commercial, industrial, and landscape irrigation. As of 2010, the City maintains 2,548 meters, which represents the total connections in the service area. These meters are classified into the following categories: 2,112 single family residential, 106 multi-family residential, 167 commercial/institutional, 16 multi-family irrigation, 47 City and City Irrigation, and 125 commercial landscape irrigation.

Figure 3.3 shows the current year 2010 distribution of connections along with the distribution of water use. The past and current water system demands by category and the projected water use over the planning horizon of the 2010 UWMP are provided in Table 3.7 and Table 3.8.

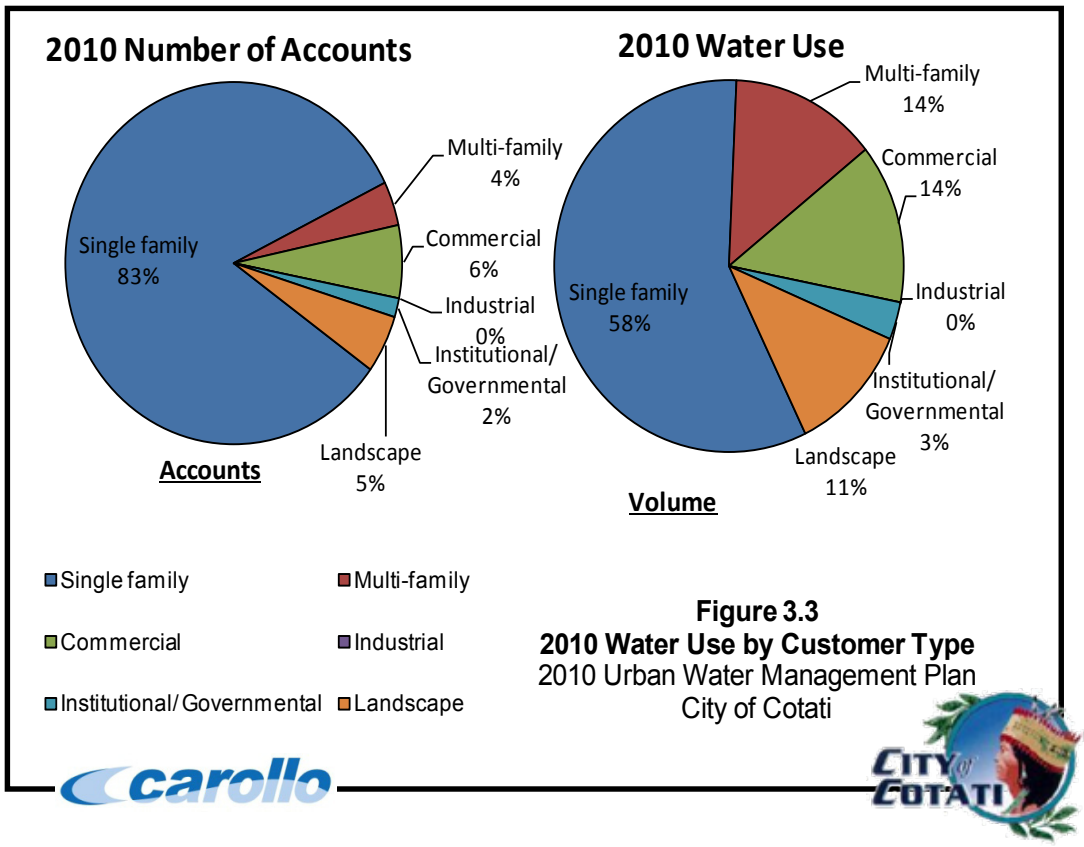


Figure 3.3
2010 Water Use by Customer Type
2010 Urban Water Management Plan
City of Cotati

Table 3.7 Water Deliveries – Actual 2005 (Guidebook Table 3)
2010 Urban Water Management Plan
City of Cotati

Water Use Sectors	2005				
	Metered		Not Metered		Total Deliveries (AFY)
	# of Accounts	Deliveries (AFY)	# of Accounts	Deliveries (AFY)	
Single Family Residential	2,035	549	0	0	549
Multi-Family Residential	97	128	0	0	128
Commercial	161	133	0	0	133
Industrial	0	0	0	0	0
Institutional/ Governmental	42	31	0	0	31
Landscape Irrigation	142	123	0	0	123
Agriculture	0	0	0	0	0
Other	0	0	0	0	0
Total	**2,477**	**964**	**0**	**0**	**964**

Notes:
(1) Source: 2005 City Production and Consumption Data.

Table 3.8 Water Deliveries – Actual 2010 (Guidebook Table 4)
2010 Urban Water Management Plan
City of Cotati

Water Use Sectors	2010				
	Metered		Not Metered		Total Deliveries (AFY)
	# of Accounts	Deliveries (AFY)	# of Accounts	Deliveries (AFY)	
Single Family Residential	2,112	450	0	0	450
Multi-Family Residential	106	116	0	0	116
Commercial	167	100	0	0	100
Industrial	0	0	0	0	0
Institutional/ Governmental	47	32	0	0	32
Landscape Irrigation	141	105	0	0	105
Agriculture	0	0	0	0	0
Other	0	0	0	0	0
Total	**2,573**	**803**	**0**	**0**	**803**

Notes:
(1) Source: 2010 Production and Consumption data.

3.2.2 Water Demand Projections

The 2010 Urban Water Management Plan Water Demand Analysis and Water Conservation Measures Update performed in November 2010 by Maddaus Water Management (Maddaus Report) were used for all projections (Appendix B).

Tables 3.9 to 3.11 summarize the projected water demands to meet the City's 2020 water use target.

3.2.3 Sales to Other Agencies

To date, the City has made no sales to other agencies, nor does the City anticipate any in the future (See Table 3.12).

3.2.4 Other Water Demands

Additional water uses and losses in the City's service area are presented in Table 3.13 below. System losses provided in Table 3.13 for years 2005 and 2010 are based on historic data from the City. Projected system losses for years 2015 to 2035 are based on projections provided in the Maddaus Report.

Table 3.9 Water Deliveries – Projected 2015 (Guidebook Table 5)
2010 Urban Water Management Plan
City of Cotati

	2015				
	Metered		Not Metered		Total
Water Use Sectors	# of Accounts	Deliveries (AFY)	# of Accounts	Deliveries (AFY)	Deliveries (AFY)
Single Family Residential	2,224	588	0	0	588
Multi-Family Residential	106	135	0	0	135
Commercial	169	130	0	0	130
Industrial	0	0	0	0	0
Institutional/Governmental	46	37	0	0	37
Landscape Irrigation	149	134	0	0	134
Agriculture	0	0	0	0	0
Other	0	0	0	0	0
Total	**2,693**	**1,024**	**0**	**0**	**1,024**

Notes:
(1) Source: 2010 Urban Water Management Plan Water Demand Analysis and Water Conservation Measures Update (Maddaus Water Management Table 6). Numbers in this table are taken directly from Table 6.

Table 3.10 Water Deliveries – Projected 2020 (Guidebook Table 6)
2010 Urban Water Management Plan
City of Cotati

Water Use Sectors	2020				
	Metered		Not Metered		Total
	# of Accounts	Deliveries (AFY)	# of Accounts	Deliveries (AFY)	Deliveries (AFY)
Single Family Residential	2,337	603	0	0	603
Multi-Family Residential	111	137	0	0	137
Commercial	177	135	0	0	135
Industrial	0	0	0	0	0
Institutional/Governmental	48	39	0	0	39
Landscape Irrigation	157	141	0	0	141
Agriculture	0	0	0	0	0
Other	0	0	0	0	0
Total	**2,831**	**1,056**	**0**	**0**	**1,056**

Notes:
(1) Source: 2010 Urban Water Management Plan Water Demand Analysis and Water Conservation Measures Update (Maddaus Water Management Table 6). Numbers in this table are taken directly from Table 6.

Table 3.11 Water Deliveries – Projected 2025, 2030, 2035 (Guidebook Table 7)
2010 Urban Water Management Plan
City of Cotati

Water Use Sectors	2025		2030		2035	
	Metered		Metered		Metered	
	# of Accounts	Deliveries (AFY)	# of Accounts	Deliveries (AFY)	# of Accounts	Deliveries (AFY)
Single Family Residential	2,456	620	2,581	642	2,713	667
Multi-Family Residential	117	141	123	145	129	150
Commercial	223	166	282	207	321	234
Industrial	0	0	0	0	0	0
Institutional/Governmental	51	41	53	43	56	45
Landscape Irrigation	194	174	242	216	273	244
Agriculture	0	0	0	0	0	0
Other	0	0	0	0	0	0
Total	**3,041**	**1,142**	**3,281**	**1,253**	**3,492**	**1,340**

Notes:
(1) Source: 2010 Urban Water Management Plan Water Demand Analysis and Water Conservation Measures Update (Maddaus Water Management Table 6). Numbers in this table are taken from Table 6.

Table 3.12 Sales to Other Water Agencies (Guidebook Table 9) 2010 Urban Water Management Plan City of Cotati							
	Water Use (AFY)						
Agency	**2005**	**2010**	**2015**	**2020**	**2025**	**2030**	**2035**
None	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Total	**N/A**	**N/A**	**N/A**	**N/A**	**N/A**	**N/A**	**N/A**

Table 3.13 Additional Water Uses and Losses (Guidebook Table 10) 2010 Urban Water Management Plan City of Cotati							
Water Use [1]	**2005**[2]	**2010**[2]	**2015**[3]	**2020**[3]	**2025**[3]	**2030**[3]	**2035**[3]
Saline Barriers	0	0	0	0	0	0	0
Groundwater Recharge	0	0	0	0	0	0	0
Conjunctive Use	0	0	0	0	0	0	0
Raw Water	0	0	0	0	0	0	0
Recycled Water[4]	0	0	13	32	32	32	32
System Losses	153	139	125	130	139	152	163
Other	0	0	0	0	0	0	0
Total, AFY	**153**	**139**	**138**	**162**	**178**	**184**	**195**

Notes:
(1) Any water accounted for in Guidebook Tables 3 through 7 is not included in this table.
(2) Source: City Production and Consumption Data
(3) Source: 2010 Urban Water Management Plan Water Demand Analysis and Water Conservation Measures Update (Maddaus Water Management Table 8).
(4) Source: Recycled Water Feasibility Study (Appendix D).

3.2.5 Total Water Demands

The City's total average annual demands, based on the figures presented in Tables 3.7 through 3.13, are presented in Table 3.14.

Table 3.14 Total Water Use (Guidebook Table 11) 2010 Urban Water Management Plan City of Cotati							
Water Use	**2005**	**2010**	**2015**	**2020**	**2025**	**2030**	**2035**
Total water deliveries (1)	964	803	1,024	1,056	1,142	1,253	1,340
Sales to other water agencies (2)	0	0	0	0	0	0	0
Additional water uses and losses (3)	153	139	138	162	178	184	195
Total, AFY	**1,117**	**942**	**1,162**	**1,218**	**1,320**	**1,437**	**1,535**

Notes:
(1) From Tables 3.7 to 3.11 (Guidebook Tables 3 through 7)
(2) From Table 3.12 (Guidebook Table 9)
(3) From Table 3.13 (Guidebook Table 10)

As discussed in the previous sections, the City does not have any plans for delivering urban water for uses other than municipal type uses (e.g., residential, commercial, industrial, institutional, etc.). For this reason, there should be no obstacles to the City providing water for the demand projections presented in Table 3.13 from a technical or economic perspective.

3.2.6 Lower Income Household Water Use Projections

The UWMPA requires that retail water agencies include projected water use for lower income single family and multifamily households.

Law

> *10631.1 (a) The water use projections required by Section 10631 shall include projected water use for single-family and multifamily residential housing needed for lower income households, as defined in Section 50079.5 of the Health and Safety Code, as identified in the housing element of any city, county, or city and county in the service area of the supplier.*

Table 3.15 projects water demands associated with lower income water users through year 2035. These estimates were generated based on the City of Cotati Housing Element, and are the City's best estimate of lower income water use at this point. It should be noted that the lower income demand projections presented in Table 3.15 are included in the total water use projections provided in Table 3.7 through Table 3.14.

The household income distribution number of households from Table 15 of the housing element shows that approximately 33 percent of the households have low-income or very low income. Table 3.15 shows the projected water demands based on 33 percent of the total City demand for low income single family and multi-family users.

Table 3.15 Low Income Projected Water Demands (Guidebook Table 8) 2010 Urban Water Management Plan City of Cotati					
Low Income Water Demands	**2015**	**2020**	**2025**	**2030**	**2035**
Single Family Residential	193	198	203	210	217
Multi-Family Residential	44	45	46	47	49
Total, AFY	**238**	**243**	**249**	**257**	**266**
Notes: (1) Source: Table 15 from the Housing Element within the 1998 General Plan					

3.3 WHOLESALE WATER DEMAND PROJECTIONS

The UWMP requires retail water agencies that receive wholesale water to report the projected water demand data that was sent to each wholesale agency from which it receives water.

Law

> *10631 (k). Urban water suppliers that rely upon a wholesale agency for a source of water shall provide the wholesale agency with water use projections from that agency for that source of water in five-year increments to 20 years or as far as data is available. The wholesale agency shall provide information to the urban water supplier for inclusion in the urban water supplier's plan that identifies and quantifies, to the extent practicable, the existing and planned sources of water as required by subdivision (b), available from the wholesale agency to the urban water supplier over the same five-year increments, and during various water-year types in accordance with subdivision (c). An urban water supplier may rely upon water supply information provided by the wholesale agency in fulfilling the plan informational requirements of subdivisions (b) and (c).*

The City currently receives water from the SCWA as a wholesale water agency as seen in (Table 3.16). The projected water demands were taken as a ratio of the projections from the Maddaus report. The projected water use is expected to continue to be approximately 72 percent of the total water supply and this can be seen in Table 3.16.

Table 3.16 Retail Agency Demand Projections Provided to Wholesale Suppliers (Guidebook Table 12) 2010 Urban Water Management Plan City of Cotati							
	Contracted Volume[1] (AFY)	Water Use (AFY)[2]					
Wholesaler		2010	2015	2020	2025	2030	2035
Sonoma County Water Agency	1,520	646	816	974	1,065	1,155	1,246

Note:
(1) Annual Entitlement Limit per Section 3.1 of the Restructured Agreement for Water Supply (Appendix C) – (See Section 5.1.2.1 for details on entitlement limit).
(2) Source: SCWA 2010 UWMP Table 3-2.

3.4 WATER USE REDUCTION PLAN

The UWMPA requires that retail water agencies develop an implementation plan for compliance with the SBx7-7 water use targets.

Law

> *10608.36. Urban wholesale water suppliers shall include in the urban water management plans . . . an assessment of their present and proposed future measures, programs, and policies to help achieve the water use reductions required by this part.*
>
> *10608.26. Urban retail water suppliers are to prepare a plan for implementing the Water Conservation Bill of 2009 requirements and conduct a public meeting, which includes consideration of economic impacts.*

The City continues to develop measures, programs and policies to help achieve water use reductions. Currently the City is implementing 13 of the 14 Demand Management Measures (DMM's) and is striving to bring down water use within the City. The status and projections for these DMM's will be discussed further in Chapter 6.

Unaccounted-for water is the difference between the total amount of water produced and the amount of water billed. The City has consistently seen greater than 10% on an average annual basis and has been working to determine the causes for the unaccounted water. There is a possible water reduction savings from this unaccounted-for water that can be applied to the savings for the SBx7-7 water use target. The City's unaccounted-for water represents 11 percent of the total demand for the period of 1995 to 2010. The City's goal is to achieve a 5 percent reduction of total demand through efforts in reducing unaccounted-for water.

To achieve the necessary amount of projected water conservation, the City should prioritize its efforts towards implementing DMM programs to result in large conservation gains.

Implementations of residential, multi-family, and commercial retrofits may be necessary to reach conservation goals. Finally, although some of the DMMs the City is currently implementing do not result in beneficial conservation savings, school and public education programs will provide much needed support as the City strives to meet SBx7-7 water use target. More on the water use reductions is discussed in the Maddaus Water Management report (Appendix B).

SYSTEM SUPPLIES

The Urban Water Management Planning Act (UWMPA) requires that the Urban Water Management Plan (UWMP) include a description of the agency's existing and future water supply sources for the next 20 years. The description of water supplies must include detailed information on the groundwater basin such as water rights, determination if the basin is in overdraft, adjudication decree, and other information from the groundwater management plan.

Law

10631. A plan shall be adopted in accordance with this chapter and shall do all of the following:

10631 (b). Identify and quantify, to the extent practicable, the existing and planned sources of water available to the supplier over the same five-year increments described in subdivision (a) [to 20 years or as far as data is available]. If groundwater is identified as an existing or planned source of water available to the supplier, all of the following information shall be included in the plan:

10631 (b) (1). (Provide a) copy of any groundwater management plan adopted by the urban water supplier…

10631 (b) (2). (Provide a) description of any groundwater basin or basins from which the urban water supplier pumps groundwater. For those basins for which a court or board has adjudicated the rights to pump groundwater, (provide) a copy of the order or decree adopted by the court or by the board…(Provide) a description of the amount of groundwater the urban water supplier has the legal right to pump under the decree…For basins that have not been adjudicated, information as to whether the department has identified the basin or basins as overdrafted or has projected that the basin will become overdrafted if present management conditions continue, in the most current official departmental bulletin that characterizes the condition of the groundwater basin, and a detailed description of the efforts being undertaken by the urban water supplier to eliminate the long-term overdraft condition.

10631 (b) (3). (Provide a) detailed description and analysis of the location, amount, and sufficiency of groundwater pumped by the urban water supplier for the past five years. The description and analysis shall be based on information that is reasonably available, including, but not limited to, historic records.

10631 (b) (4). (Provide a) detailed description and analysis of the amount and location of groundwater that is projected to be pumped by the urban water supplier. The description and analysis shall be based on information that is reasonable available, including, but not limited to, historic use records.

4.1 WATER SUPPLY SOURCES

This section summarizes the existing and projected water supply sources for the City of Cotati (City). The City's water supply system consists of two turnouts from the Sonoma

County Water Agency (SCWA), as well as three groundwater wells. Water is transmitted from the City's supply sources to the consumers via a distribution system with pipe sizes ranging from 4 to 16-inches in diameter. The City's distribution system also includes two storage tanks, one of which is currently out of service. Figure 4.1 shows the City's current water distribution system, including pipe diameters, as well as groundwater wells, SCWA turnouts, and storage tank locations.

4.1.1 Groundwater Wells

There are currently three groundwater wells located within the City's water distribution system. The following provides a general summary of the wells, based on information provided by City staff.

- **Well No. 1A:** Well 1, was constructed in 1975 and subsequently renovated and changed to well 1A in the early 1990s, then once again renovated in 2010. Well 1A is equipped with a 25-horse power (HP) vertical turbine pump. The 25 HP pump is rated for a capacity of roughly 425 gallons per minute (gpm) at approximately 125 feet of head.

  Based on information from City staff, the 25 HP pump fills a storage tank that supplies a 40 HP booster pump station. The 40 HP booster station has a capacity ranging from 340 gpm to 390 gpm, with an estimated design head of 430 ft. The booster delivers supply to the distribution system by pumping through a pressure filter.
- **Well No. 2:** Well 2, which was constructed in 1976, and renovated in 2009 is equipped with a 50 HP vertical turbine pump. The 50 hp pump is rated for a capacity of roughly 380 gpm at approximately 382 feet of head.
- **Well No. 3:** Well 3, which was constructed in 1979 and subsequently renovated in 2010, is equipped with a 100 hp vertical turbine pump. The 100 hp pump is rated for a capacity of roughly 700 gpm at approximately 380 feet of head.

Table 4.1 summarizes the available data for the groundwater wells.

Table 4.1 Groundwater Well Summary 2010 Urban Water Management Plan City of Cotati				
Facility Name	**Location**	**Pump[(1)] Station Elevation (feet)**	**Design Capacity (gpm)**	**Design Head (ft)**
Well 1A	90 East Sierra Avenue in the Hub	106	425	125
Well 1A Booster[(3)]	90 East Sierra Avenue in the Hub	106	340 – 390	430
Well 2	8562 Lakewood Avenue	111.8	380	380
Well 3	Northwest corner of Cotati, along the Laguna near Houser St	94.5	700	380
Notes: (1) Source: City of Cotati 2010 Draft Water System Master Plan.				

The historic average production percentage by source is illustrated in Figure 4.2. As shown on Figure 4.2, the majority of the City's water demands were met through the SCWA wholesale supply source, accounting for roughly 72 percent of the City's supply. The remaining 28 percent of supply was obtained through the City's three groundwater wells.

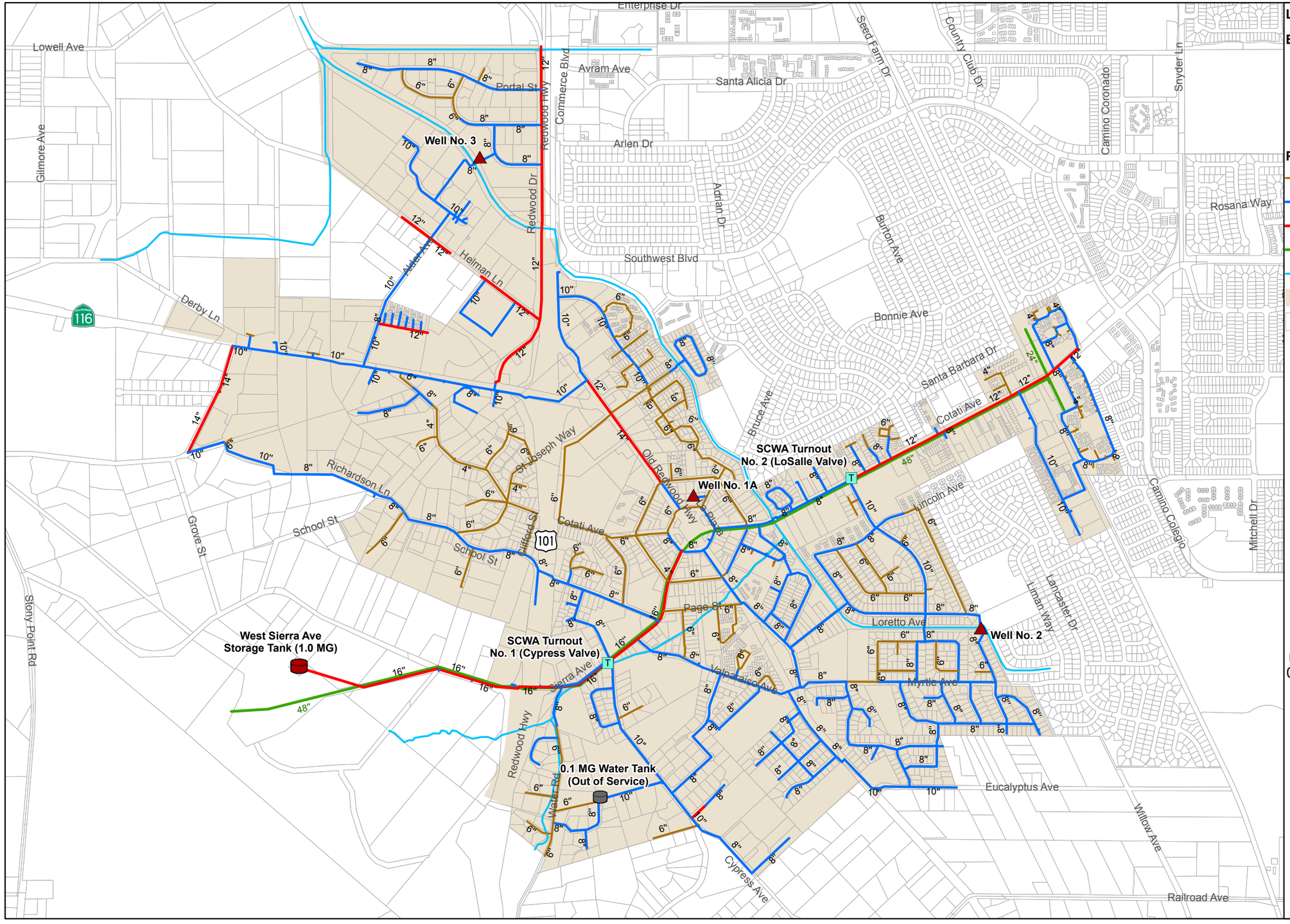


Figure 4.1
Existing Water Distribution System
2010 Urban Water Management Plan
City of Cotati

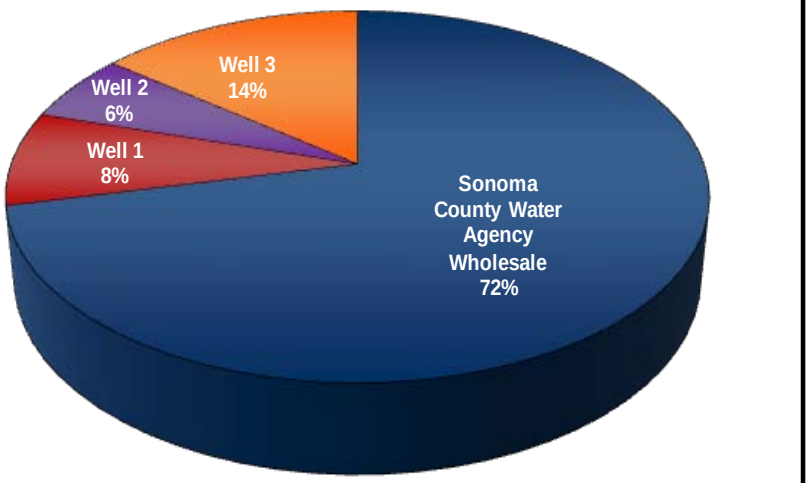


Figure 4.2
Historical Production
by Source (1995 - 2009)
2010 Urban Water Management Plan
City of Cotati

4.1.2 Sonoma County Water Agency (SCWA)

The information presented in this section was taken from the Sonoma County Water Agency's 2005 and 2010 Urban Water Management Plans. This section is used to describe the City's wholesale water supply, facilities, and projections provided by the SCWA.

The Russian River provides the majority of SCWA's water supply. Most of the SCWA's Customers use other water supplies, in addition to those provided by the SCWA, including local surface water, local groundwater, and recycled water. These local supplies are accounted for in these entities' retail urban water management plans. With the exception of limited quantities of water sold by the SCWA to government entities and a few "surplus water" and fire service customers, all of the water supplied by the SCWA through the water transmission system is sold wholesale to retail water suppliers.

The SCWA's system is comprised of multiple support facilities that divert flow from the Russian River in order to supply naturally filtered groundwater to its agencies. The SCWA can divert water from the natural flow of the Russian River, water stored in winter for release from Lake Sonoma, and water stored for later release in Lake Mendocino. Inflows into Lake Mendocino is from the watershed and diversions through the Potter Valley Project. Lake Sonoma is created by Warm Springs Dam and Lake Mendocino is created by Coyote Dam. These dams are federal projects under the jurisdiction of the United States Army Corps of Engineers (Corps), and SCWA controls water releases from the

supply pools. Lake Sonoma has a supply up to 212,000 acre-feet and Lake Mendocino has a supply up to 70,000 acre-feet.

The SCWA diverts water from the Russian River and delivers it to the SCWA's Customers through a transmission system. The SCWA's diversion facilities extract Russian River underflow, which is reported under the SCWA's surface water rights. The Water Agency operates six radial collector wells at the Wohler and Mirabel production facilities adjacent to the Russian River. Each collector well consists of a 13 to 18 foot diameter concrete caisson extending vertically approximately 60 to 110 feet into the alluvial aquifer. Horizontal perforated intake laterals extend radially from the bottom of each caisson into the aquifer. Each collector well houses two vertical turbine pumps driven by electrical motors.

The SCWA also operates the Russian River Well Field consisting of seven vertical wells located in the Mirabel area. These wells are currently not operated as primary production facilities, but are maintained for standby production and may be used as primary production facilities as needed. Three of the wells have a direct connection to the transmission system. An important method used to increase production capacity during peak demand months involves raising an inflatable dam on the Russian River near Mirabel that allows for operation of five infiltration ponds at Mirabel that increase the area of infiltration along the Russian River. Water pools behind the inflatable dam and is diverted into the infiltration ponds to recharge the aquifer in the vicinity of Collectors 3, 4, and 5. Backwater conditions along the river also result in increased infiltration in the Wohler area, thereby enhancing the production capacity of Collectors 1, 2 and 6. The SCWA's transmission system extends from the SCWA's Russian River diversion facilities located near Forestville to the Santa Rosa, Petaluma, and Sonoma valleys. The transmission system consists of over 85 miles of pipelines that range in diameter from 16 to 54 inches, seven booster pump stations, and 18 storage tanks with a combined storage capacity of 129 million gallons. The major pipelines that comprise the system are known as the Santa Rosa Aqueduct (built in 1959), the Sonoma Aqueduct (built in 1963), the Petaluma Aqueduct (built in 1962), and the Russian River to Cotati Intertie (built in 1977). The SCWA owns the northern portion of the North Marin Aqueduct that extends from the terminus of the Petaluma Aqueduct to the Kastania Booster Station, located near the border of Marin County with Sonoma County. The remainder of the North Marin Aqueduct is owned and maintained by the North Marin Water District, which transfers water to the District's service area. The SCWA's major storage facilities are located at Ralphine (36 MG), Cotati (36 MG), Kawana Springs (20 MG), Kastania (12 MG), Sonoma (10 MG), Eldridge (8.0 MG), and Annadel (5.5 MG).

The City has two connection points to the SCWA's 48-inch aqueduct that runs through the City along West Sierra Avenue and East Cotati Avenue. The turnouts are both equipped with an isolation valve, flow meter, and a pressure-reducing valve (PRV). The PRVs are

set to regulate downstream pressures to roughly 70 pounds per square inch (psi). Table 4.2 summarizes the available data for the turnouts.

Table 4.2 Summary of Turnouts from SCWA 2010 Urban Water Management Plan City of Cotati

Facility Name	Location	PRV Pressure Setting (psi)	Turnout Elevation (ft)	Turnout HGL (ft)
Turnout No. 1	Intersection of West Sierra Avenue and Cypress Avenue	70	128.1	289.6
Turnout No. 2	East Cotati Avenue, east of LeSalle Avenue	70	109.7	271.2

Notes:
(1) Source: City of Cotati 2010 Draft Water System Master Plan.

As previously noted, the City purchases wholesale water as its primary supply of potable water from SCWA. As such, the City has provided demand projections to SCWA for the next 25 years. SCWA delivers water, on a wholesale basis, to customers through its water transmission system. The primary water customers, collectively known as the water contractors, consist of the cities of Santa Rosa, Rohnert Park, Petaluma, Cotati, and Sonoma; the Town of Windsor; and the North Marin, and Valley of the Moon Water Districts. The responsibility for supplying water to the water contractors is entrusted to the SCWA under the Restructured Agreement for Water Supply (Appendix C), which was executed in June 2006. Under Section 3.1 of this agreement, the City has an annual entitlement limit of up to 1,520 AFY. Furthermore, it is anticipated that the City will continue to obtain the majority of its water supply in the future from SCWA. Table 4.3 summarizes the entitlement limit and the projected water supply provided by SCWA.

Table 4.3 Wholesale Supplies – Existing and Planned Sources of Water (Guidebook Table 17) 2010 Urban Water Management Plan City of Cotati

Wholesale Sources	Contracted Volume[(1)] (AFY)	2015	2020	2025	2030	2035
Sonoma County Water Agency[(2)]	1,520	816	974	1,065	1,155	1,246
Total	1,520	816	974	1,065	1,155	1,246

Notes:
(1) Annual Entitlement Limit per Section 3.1 of the Restructured Agreement for Water Supply (Appendix C) – (See Section 5.1.2.1 for details on entitlement limit).
(2) Source: Sonoma County Water Agency 2010 UWMP (Table 3-2).

4.1.3 Distribution System and Storage

The City's water distribution system consists of approximately 30 miles of active distribution system pipelines ranging in size from 4-inches to 16-inches in diameter. Table 4.4 presents a summary by diameter of the distribution system pipelines in the City. The City's distribution system network is shown on Figure 4.1.

Table 4.4 Water Distribution System Pipeline Summary
2010 Urban Water Management Plan
City of Cotati

Diameter (inch)	Length (feet)	Diameter (inch)	Length (feet)
4	5,056	12	10,535
6	40,467	14	2,747
8	70,269	16	5,836
10	24,897	Total	159,808

Notes:
(1) Source: City of Cotati 2010 Draft Water System Master Plan.

There are currently two storage tanks located within the City's water distribution system:

- **West Sierra Avenue Storage Tank:** 1.0 million gallons (MG), located west of Highway 101, just south of West Sierra Avenue, outside of the City limits.
- **Cypress Avenue Storage Tank:** 100,000 gallons, located at the end of Loma Linda Avenue. This storage tank is out of service.

Table 4.5 summarizes the available data for the storage tanks.

Table 4.5 Storage Tank Summary
2010 Urban Water Management Plan
City of Cotati

Facility Name	Location	Status	Volume (MG)	Dimensions	Base Elevation (ft)	Overflow Elevation (ft)
West Sierra Avenue Storage Tank	West of Highway 101, south of West Sierra Avenue	In Service	1.0	83' Diameter 27' Height	249	274
Cypress Avenue Storage Tank	End of Loma Linda Avenue	Out of Service	0.1	27' Diameter 25' Height	249	274

Notes:
(1) Source: City of Cotati 2010 Draft Water System Master Plan.

4.1.4 Current and Projected Water Sources

Table 4.6 summarizes the current and projected water supply sources for the City. As shown in Table 4.6, the City plans to continue to obtain the majority of its water supply

from the two turnouts supplied by SCWA. Values presented assume that the City will continue to obtain a large portion of its supply from SCWA, with the remaining water provided through the City's groundwater wells.

Table 4.6 Water Supplies – Current and Projected (Guidebook Table 16)
2010 Urban Water Management Plan
City of Cotati

Water Supply Sources		Projected Supply (AFY)					
Water Purchased From:	**Wholesaler Supplied Volume (yes/no)**	**2010**	**2015**	**2020**	**2025**	**2030**	**2035**
Wholesaler 1 – Sonoma County Water Agency[1]	Yes	646	816	974	1,065	1,155	1,246
Supplier-produced groundwater[2, 3]		295	530	530	530	530	530
Supplier-produced surface water		0	0	0	0	0	0
Transfers in		0	0	0	0	0	0
Exchanges in		0	0	0	0	0	0
Recycled Water[4]		0	13	32	32	32	32
Desalinated Water		0	0	0	0	0	0
Future Water Conservation[5]		--	104	148	191	232	268
Total		**941**	**1,463**	**1,684**	**1,818**	**1,949**	**2,076**

Notes:
(1) Source: Sonoma County Water Agency 2010 UWMP (Table 3-2).
(2) Source: 2010 City Production and Consumption Data.
(3) Source: Projections Provided per Luhdorff and Scalmanini Report, January 2008.
(4) Source: Recycled Water Feasibility Study (Appendix D).
(5) Source: 2010 Urban Water Management Plan Water Demand Analysis and Water Conservation Measures Update (Maddeus Water Management).

4.2 GROUNDWATER BASIN

This section 4.2 is taken from the Department of Water Resource's California Groundwater Bulletin 118 (Updated in 2004).

For planning purposes, the Department of Water Resources (DWR) has subdivided the State of California into ten separate hydrologic regions, corresponding to the State's major drainage basins. The City is located within the North Coast Hydrologic Region.

Groundwater within the State is divided into distinct groundwater basins, some of which are further divided into smaller interconnected sub-basins. This section summarizes the groundwater basin underlying the City.

4.2.1 Groundwater Basin Description

The groundwater underlying the City is located within the Santa Rosa Valley Groundwater Basin (Figure 4.3). This Basin contains multiple interconnected subbasins that transmit, filter, and store water. The City resides in the Santa Rosa Plain Subbasin (DWR number 1-55.01).

The Santa Rosa Valley occupies a northwest-trending structural depression in the southern part of the Coast Ranges of northern California. This depression divides the Mendocino Range on the west from the Mayacmas and Sonoma Mountains on the east. The Santa Rosa Plain subbasin is approximately 22 miles long and 0.2 miles wide at the northern end; approximately 9 miles wide through the Santa Rosa area; and about 6 miles wide at the south end of the valley near the City. The Santa Rosa Plain Subbasin is bounded on the northwest by the Russian River plain approximately one mile south of the City of Healdsburg and the Healdsburg subbasin; mountains of the Mendocino Range flank the remaining western boundary. The southern end of the subbasin is marked by a series of low hills, which form a drainage divide that separates the Santa Rosa Valley from the Petaluma Valley basin south of Cotati. The eastern subbasin boundary is flanked by the Sonoma Mountains south of Santa Rosa and the Mayacmas Mountains north of Santa Rosa. The Rincon Valley subbasin is situated east of the City of Santa Rosa and is separated from the Santa Rosa Plain subbasin by a narrow constriction formed in rocks of the Sonoma Volcanics. The Santa Rosa Plain Subbasin is drained principally by the Santa Rosa and Mark West Creeks that flow westward and collect into the Laguna de Santa Rosa. The Laguna de Santa Rosa flows northward and discharges into the Russian River. Precipitation in the Santa Rosa Plain ranges from approximately 28 inches in the south to about 40 inches in the north.

4.2.1.1 Hydrogeologic Information Water Bearing Formations

The Santa Rosa Plain subbasin has one main water-bearing unit (Merced Formation) and several units with lower water-bearing capacities (Glen Ellen Formation and Alluvium). The groundwater is not everywhere continuous because many of the units only have lenses of water-bearing material, and the valley is cut by northwest trending faults.

4.2.1.2 Alluvium

Alluvial deposits blanket most of the Santa Rosa Valley. The deposits consist of poorly sorted coarse sand and gravel, and moderately sorted fine sand, silt, and clay, and have a specific yield of 8 to 17 percent (DWR 1982). The source of the fine sand may be the Merced Formation. The older alluvial deposits are Late Pleistocene in age, are sometimes dissected, and have a maximum exposed thickness of 100 feet (Cardwell 1958). The younger alluvium is a thin veneer over the old, ranging from 30 to 100 feet thick, and is Late Pleistocene to Holocene in age. The deposits are not perennially saturated, have low permeability, and are generally unconfined or slightly confined (Cardwell 1958). Although the water quality North Coast Hydrologic Region California's Groundwater Santa Rosa

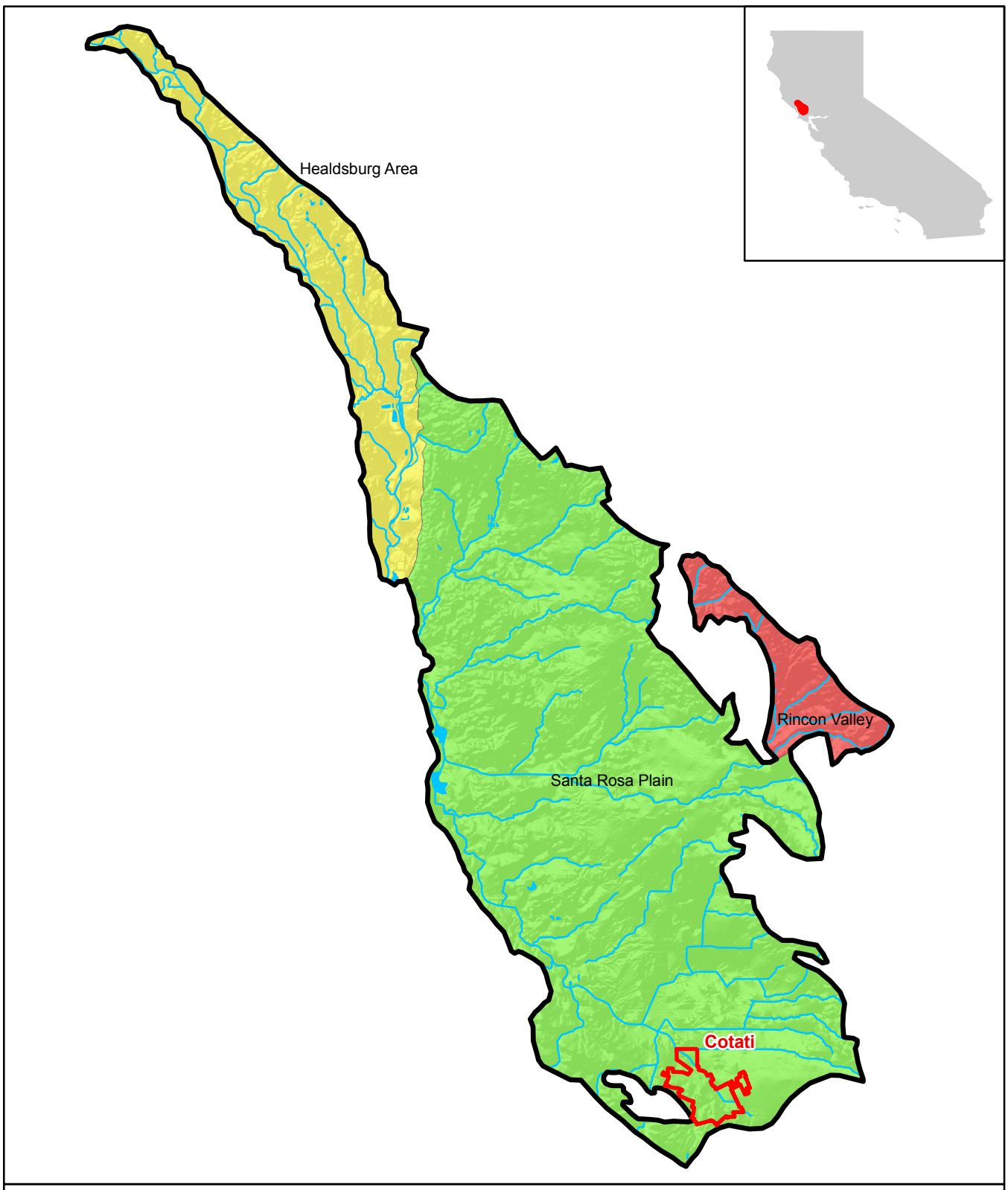


Figure 4.3
Santa Rosa Valley Groundwater Basin
2010 Urban Water Management Plan
City of Cotati

Valley Groundwater Basin (Bulletin 118 Last update 2/27/04) is generally good for most uses, there are few wells screened adjacent to the deposits (Cardwell 1958).

4.2.1.3 Glen Ellen Formation

The Glen Ellen Formation crops out extensively in the center of the Santa Rosa Plain, and extends beneath the eastern hills (Cardwell 1958). In most places, it overlies the Merced Formation and some places the two formations are continuous, together housing the principal water body in the basin (Cardwell 1958). The Glen Ellen consists of partially cemented beds and lenses of poorly sorted gravel, sand, silt, and clay that vary widely in thickness and extent (Cardwell 1958; DWR 1982). It is reported that some wells sourced from the Glen Ellen produce more than 500 gal/min, but for most wells the specific capacities are less than 10 gpm/ft (Cardwell 1958). Most of the water under the Santa Rosa Valley is at water table conditions, but locally the water can be confined in areas of folding and faulting. Since the unit crops out in favorable areas and has moderate permeability (HLA 1978), recharge may occur fairly quickly, but it can be inhibited in areas of well-developed soils with hardpan (Cardwell 1958). Average specific yield for the Glen Ellen Formation is 3 to 7 percent (DWR 1982). It is tapped for domestic and some irrigation use.

4.2.1.4 Merced Formation

The Merced Formation is the major water-bearing unit in the basin. It extends beneath the western hills, crops out along the western side of the valley from the Russian River (Wilson Grove) south towards Petaluma, and dips beneath the center of the valley (Cardwell 1958). It is Pliocene in age, and its thickness is estimated to range from 300 to greater than 1,500 feet. The Merced Formation is a marine deposit of fine sand and sandstone, but has thin interbeds of clay and silty-clay, some lenses of gravel, and localized fossils (Cardwell 1958). Aquifer continuity and water quality are generally very good, with well yields from 100 to 1,500 gpm (Cardwell 1958) and specific yields from 10 to 20 percent (DWR 1982). Semi-confined to confined conditions may exist locally where clay lenses occur. Recharge occurs in the southwest portion of the basin, but is not at the maximum because much of the permeable soil is on slopes too steep for good recharge (DWR 1982). Some recharge may occur from the overlying Glen Ellen Formation (HLA 1978).

4.2.2 Groundwater Management Plan

The Santa Rosa Plain Sub-basin is the largest basin in Sonoma County and underlies the most populated areas of the Sonoma County. In December 2005, the USGS and the Water Agency began a comprehensive basin study similar to the studies completed for the Alexander and Sonoma Valleys. This $2.2 million study is being funded by the Water Agency, City of Santa Rosa, City of Cotati, City of Rohnert Park, City of Sebastopol, Town of Windsor, County of Sonoma, California American Water Company, and USGS. The study has four principal elements: (1) a comprehensive geographic information system

(GIS) to compile, analyze and visualize hydrologic and related data; (2) collection of new data, with a focus of water-quality sampling; (3) data interpretation and hydrogeologic characterization – including refining hydrologic budgets, and updating conceptual models of the groundwater flow system based on the new data and the results of ongoing USGS geologic and geophysical studies in the basin; and (4) the development of a fully-coupled numerical surface water/groundwater flow model for Santa Rosa Plain. The study is nearing completion and publication of study results is scheduled for late 2011. Results from the study will provide stakeholders with tools to assist in evaluating the hydrologic impacts of future climate-change scenarios and alternative groundwater management strategies for the basin.

4.2.3 Groundwater Levels and Historical Trends

The Santa Rosa Plain ground water basin as a whole is about in balance, with increased ground water levels in the northeast contrasting with decreased ground water levels in the south (DWR 1982).

The USGS estimated the gross groundwater storage capacity for this basin to be about 948,000 af based on an average specific yield of 7.8 percent for aquifer materials at depths of 10 to 200 feet (Cardwell 1958). The DWR performed a study of the area and calculated a groundwater storage capacity for this basin to be approximately 4,313,000 af (DWR 1982). This calculation was made by dividing the North Coast Hydrologic Region California's Groundwater Santa Rosa Valley Groundwater Basin Bulletin 118 Last update 2/27/04 approximate basin area into a grid of 193 cells ranging in size from 320 to 640 acres. Specific yield values were calculated for each cell using lithologic and aquifer thickness data processed by the TRANSCAP computer program. In the DWR study, aquifer thicknesses ranged from 50 to over 1,000 feet with an average thickness of approximately 400 feet.

Using water level information for the spring of 1980 and the product of the TRANSCAP program, the volume of groundwater in storage was estimated to be 3,910,000 acre-feet (AF) (DWR 1982). Groundwater Budget (Type A) A groundwater model for the Santa Rosa Plain Subbasin was prepared by the DWR (DWR 1982). The 15-year period from 1960-61 through 1974-75 was selected as the study period for the Santa Rosa Plain basin because it contained a mixture of wet and dry years approximating long-term climatic conditions. Average annual natural recharge for the period 1960 to 1975 was estimated to be about 29,300 AF. Average annual pumping during the same time period was estimated to be approximately 29,700 AF.

4.3 EXISTING AND PROJECTED GROUNDWATER PUMPING

In addition to water received from SCWA, the City also utilizes groundwater as a source of supply, which is extracted from underground aquifers via three active groundwater wells (Figure 4.1). The historical volume of groundwater pumped by the City over the past five

years is provided in Table 4.7.

Table 4.7 Historic Groundwater Pumping (Guidebook Table 18) 2010 Urban Water Management Plan City of Cotati						
		Historic Pumping Rates[1] (AFY)				
Basin Name		2006	2007	2008	2009	2010
Santa Rosa Valley Plain	Metered	80	295	312	358	295
	Total	80	295	312	358	295
Groundwater As Percent of Total Water Supply		**7%**	**26%**	**30%**	**35%**	**31%**
Note: (1) Source: Historic Groundwater Pumping Rates.						

The City's water supplies are predominately obtained from SCWA accounting for an average of 72 percent of total supply since 1995 and the rest is pumped from groundwater. The projected amount of groundwater to be pumped through year 2035 is included in Table 4.8. These projected pumping rates are based on a range of 412 AFY to 530 AFY determined in the Luhdorff and Scalmanini Report. During average day demands, the City has complete redundancy in their system and can support their users by either SCWA water or City groundwater wells. With the addition of a new Well 4, the City will have firm capacity to meet maximum day demands using City groundwater wells alone through the year 2035.

Table 4.8 Projected Groundwater Pumping (Guidebook Table 19) 2010 Urban Water Management Plan City of Cotati					
	Projected Pumping Rates[1] (AFY)				
Basin Name	2015	2020	2025	2030	2035
Santa Rosa Valley Plain	530	530	530	530	530
Groundwater As Percent of Total Water Supply	**36%**	**31%**	**29%**	**27%**	**25%**
Note: (1) Projected pumping rates from Luhdorff and Scalmanini Report, January 2008.					

As shown in Table 4.8, the City will continue to pump groundwater exclusively from the Santa Rosa Plain groundwater basin to complement the wholesale water from SCWA.

4.4 TRANSFER AND EXCHANGE OPPORTUNITIES

The UWMPA requires that the UWMP address the opportunities exchanges or transfers.

Law

> *10631 (d). Describe the opportunities for exchanges or transfers of water on a short-term or long-term basis.*

The City's water supply sources (i.e., SCWA supply, groundwater) have sufficient capacity for the planning horizon. Therefore, the use of water transfers or exchanges is not necessary to augment supply. For this reason, the City does not anticipate any opportunities for water transfers or exchanges (Table 4.9).

Table 4.9 Transfer and Exchange Opportunities (Guidebook Table 20)
2010 Urban Water Management Plan
City of Cotati

Transfer Agency	Transfer or Exchange	Short Term or Long Term	Proposed Volume (AFY)
None	n/a	n/a	n/a
Total	n/a	n/a	n/a

4.5 DESALINATED WATER OPPORTUNITIES

The UWMPA requires that the UWMP address the opportunities for development of desalinated water, including ocean water, brackish water and groundwater.

Law

> *10631 (i). Describe the opportunities for development of desalinated water, including, but not limited to, ocean water, brackish water, and groundwater, as a long term supply.*

4.5.1 Brackish Water and/or Groundwater Desalination

As summarized in Table 4.10, the groundwater that underlies the City is not brackish in nature and does not require desalination. However, the City could provide financial assistance to other purveyors in exchange for water supplies. Should the need arise, the City could consider this option.

Table 4.10 Opportunities for Desalinated Water 2010 Urban Water Management Plan City of Cotati	
Sources of Water	**Opportunities for Desalinated Water**
Ocean Water	None
Brackish Ocean Water	None
Brackish Groundwater	None
Other	None

4.5.2 Seawater Desalination

Because the City is small and inland from the coast, it is not practical, nor economically feasible to implement a seawater desalination program. However, the City could provide financial assistance to other purveyors in exchange for water supplies. Should the need arise; the City could consider this option.

4.6 RECYCLED WATER OPPORTUNITIES

The UWMPA requires that the UWMP address the opportunities for development of recycled water, including the description of existing recycled water applications, quantities of wastewater currently being treated to recycled water standards, limitations on the use of available recycled water, an estimate of projected recycled water use, the feasibility of said projected uses, and practices to encourage the use of recycled water.

Law

10633. Provide, to the extent available, information on recycled water and its potential for use as a water source in the service area of the urban water supplier. The preparation of the plan shall be coordinated with local water, wastewater, groundwater, and planning agencies that operate within the supplier's service area.

10633 (a). (Describe) the wastewater collection and treatment systems in the supplier's service area, including a quantification of the amount of wastewater collected and treated and the methods of wastewater disposal.

10633 (b). (Describe) the quantity of treated wastewater that meets recycled water standards, is being discharged, and is otherwise available for use in a recycled water project.

10633 (c). (Describe) the recycled water currently being used in the supplier's service area, including, but not limited to, the type, place, and quantity of use.

10633 (d). (Describe and quantify) the potential uses of recycled water, including, but not limited to, agricultural irrigation, landscape irrigation, wildlife habitat enhancement, wetlands, industrial reuse, groundwater recharge, indirect potable reuse, and other appropriate uses, and a determination with regard to the technical and economic feasibility of serving those uses.

10633 (e). (Describe) the projected use of recycled water within the supplier's service area at the end of 5, 10, 15, and 20 years, and a description of the actual use of recycled water in comparison to uses previously projected pursuant to this subdivision.

10633 (f). (Describe the) actions, including financial incentives, which may be taken to encourage the use of recycled water, and the projected results of these actions in terms of acre-feet of recycled water used per year.

10633 (g). (Provide a) plan for optimizing the use of recycled water in the supplier's service area, including actions to facilitate the installation of dual distribution systems, to promote recirculating uses, to facilitate the increased use of treated wastewater that meets recycled water standards, and to overcome any obstacles to achieving that increased use.

The City completed a feasibility study dated March of 2007 by Winzler and Kelly consulting engineers. This study has determined that the use of recycled water can be used from the Santa Rosa wastewater facility. This study can be seen in Appendix D.

4.6.1 Wastewater Treatment

Information on wastewater treatment was taken from the City of Santa Rosa's website for sewer and wastewater treatment. Wastewater treatment and disposal is provided for the City by the Santa Rosa Sub-regional Sewerage System (Subregional System). Subregional Operations is comprised of eight sections that operate and maintain the Laguna Treatment Plant, the Oakmont Treatment Plant, the Subregional Compost Facility and the Reclamation system. The Laguna Wastewater Treatment Plant, where the city receives wastewater treatment, takes the wastewater from homes, businesses and industry located within the city of Santa Rosa along with the other partners in the Santa Rosa Subregional Water Reuse System. The City provides sewer collection and is a partner in the Subregional System's wastewater treatment, disposal, and recycling system. The Laguna Treatment Plant is the only tertiary-level treatment facility in the Subregional System. The Plant has an average daily dry weather flow of 17.5 million gallons per day (mgd), and performs tertiary treatment through the following plant processes:

- Influent flow measurement;
- Raw sewage screening;
- Primary clarification;
- Activated sludge with an anoxic selector;
- Secondary clarification;
- Effluent flow measurement;
- Effluent pumping;

- Anaerobic sludge digestion;
- Belt press sludge dewatering;
- Conventional filtration; and
- Ultraviolet disinfection.

The Laguna Treatment Plant is permitted to discharge to the Russian River up to 5 percent of the River flow under the NPDES permit CA 0022764. There is a 40-mile long pipeline providing 11 million gallons per day (mgd) of recycled water year round to the Geysers Steamfield. There are approximately 62-miles of recycled water distribution piping delivering recycled water throughout the region to Santa Rosa and Rohnert Park.

The rated dry weather capacity of the Laguna Treatment Plant is 21 mgd and the City contributes an average annual dry weather flow of 0.58 mgd of this total capacity (Draft 2010 Collection System Master Plan). Currently the City does not receive any recycled water, nor does it pre-treat any of its own wastewater. Current and projected amounts of wastewater disposed of by the City are shown in Table 4.11.

Table 4.11 Recycled Water – Wastewater Collection and Treatment (Guidebook Table 21)
2010 Urban Water Management Plan
City of Cotati

	Volume (AFY)						
Type of Wastewater	**2005[3]**	**2010**	**2015**	**2020**	**2025**	**2030**	**2035**
Wastewater Collected in Service Area	N/A	650(1)	704	758	811	865	919(1)
Volume that meets recycled water standard(2)	N/A	650	704	758	811	865	919
Total	N/A	650	704	758	811	865	919

Notes:
(1) Source: City of Cotati Draft 2010 Collection System Master Plan. Years 2015 through 2030 were interpolated using Maddaus projections.
(2) Treatment Supplied by the Santa Rosa Sub-regional Water Reuse System. Wastewater from the City's sewer collection system meets the recycled water standard following treatment at the Santa Rosa Sub-regional Water Reuse System.
(3) Wastewater data was not available for 2005.

The City currently does not treat or dispose of wastewater generated within the service area. All the wastewater is delivered to the Santa Rosa WRP and treated to tertiary levels. Therefore, the City does not keep record of wastewater disposal as shown in Table 4.12.

Table 4.13 identifies the potential future recycled water uses for the City from the Santa Rosa Sub regional plant. Recycled water was not used during the years of 2005 to 2010 shown by Table 4.14.

Table 4.12 Recycled Water – Non-Recycled Wastewater Disposal (Guidebook Table 22)
2010 Urban Water Management Plan
City of Cotati

		Volume (AFY)					
Method of Disposal	**Treatment Level**	**2010**	**2015**	**2020**	**2025**	**2030**	**2035**
Agricultural Irrigation	Tertiary	0	0	0	0	0	0
Percolation Ponds	Secondary	0	0	0	0	0	0
	Total	0	0	0	0	0	0

Notes:(1) Information provided for the Santa Rosa Sub regional Water Reuse System.

Recycled water was not used during the years of 2005 to 2010 shown by Table 4.14.

Table 4.13 Recycled Water – Potential Future Use (Guidebook Table 23)
2010 Urban Water Management Plan
City of Cotati

			Volume (AFY)				
User Type	**Description**	**Feasibility**	**2015**	**2020**	**2025**	**2030**	**2035**
Agricultural Irrigation	N/A	0	0	0	0	0	0
Landscape Irrigation	Schools, parks	Yes	13	32	32	32	32
Commercial Irrigation	N/A	0	0	0	0	0	0
Golf Course Irrigation	N/A	0	0	0	0	0	0
Wildlife Habitat	N/A	0	0	0	0	0	0
Wetlands	N/A	0	0	0	0	0	0
Industrial Reuse	N/A	0	0	0	0	0	0
Groundwater Recharge	N/A	0	0	0	0	0	0
Seawater Barrier	N/A	0	0	0	0	0	0
Geothermal Energy	N/A	0	0	0	0	0	0
Indirect Potable Reuse	N/A	0	0	0	0	0	0
	Total	**Yes**	13	32	32	32	32

Note:
(1) Source: Recycled Water Feasibility Study (Appendix D).

Table 4.14 Recycled Water – 2005 UWMP Use Projection Compared to 2010 Actual (Guidebook Table 24) 2010 Urban Water Management Plan City of Cotati		
User Type	**2010 Actual Use**	**2005 Projection for 2010**
Agricultural Irrigation	0	0
Landscape Irrigation	0	0
Commercial Irrigation	0	0
Golf Course Irrigation	0	0
Wildlife Habitat	0	0
Wetlands	0	0
Industrial Reuse	0	0
Groundwater Recharge	0	0
Seawater Barrier	0	0
Geothermal Energy	0	0
Indirect Potable Reuse	0	0
Total:	**0**	**0**

4.6.2 Current Recycled Water Use

The City currently does not generate, nor provide recycled water for their water customers. Wastewater treatment is performed by the Sub-regional System North-West of the City. The wastewater plant provides tertiary treatment and supplies recycled water to the Cities of Santa Rosa and Rohnert Park. The City does not currently supply recycled water to its water customers.

4.6.3 Projected Recycled Water Use

The City plans on implementing alternatives 1 and 3 from the Recycled Water Feasibility Study (Appendix D). This will have a total potable water offset of 32 AFY.

4.6.4 Optimizing Recycled Water Use

The City supports use of reclaimed water in the service area where economically feasible. The City does not currently provide or maintain incentives to use reclaimed water as shown in Table 4.15.

Table 4.15 Methods to Encourage Recycled Water Use (Guidebook Table 25) 2010 Urban Water Management Plan City of Cotati					
	Projected Volume (AFY)				
Actions	**2010**	**2015**	**2020**	**2025**	**2030**
Financial Incentives	0	0	0	0	0
Other	0	0	0	0	0

4.7 FUTURE WATER PROJECTS

Law

> *10631 (h). (Describe) all water supply projects and water supply programs that may be undertaken by the urban water supplier to meet the total projected water use as established pursuant to subdivision (a) of Section 10635. The urban water supplier shall include a detailed description of expected future projects and programs, other than the demand management programs identified pursuant to paragraph (1) of subdivision (f), that the urban water supplier may implement to increase the amount of the water supply available to the urban water supplier in average, single-dry, and multiple-dry water years. The description shall identify specific projects and include a description of the increase in water supply that is expected to be available from each project. The description shall include an estimate with regard to the implementation timeline for each project or program.*

At this time, there is only one water supply project planned for the City. The City is planning on the installation of one new Well 4 with a capacity of 1.25 mgd. With the completion of this new well, expected in 2015, the City will have firm capacity to supply water demands solely on groundwater. This project is outlined in Table 4.16.

The City, teaming with SCWA, is in the process of performing a feasibility study on Aquifer Storage Recovery. The findings in this study will used to support future groundwater supply.

Table 4.16 Future Water Supply Projects (Guidebook Table 26)
2010 Urban Water Management Plan
City of Cotati

Project Name	Projected Start Date	Projected Completion Date	Potential Project Constraints	Normal-year Supply	Single Dry-year Supply	Multiple Dry-year First Year Supply	Multiple Dry-year Second Year Supply	Multiple Dry-year Third Year Supply
Well 4	2011-2015	2015	None	1.25 mgd	1.25 mgd	1.25 mgd	1.25 mgd	1.25 mgd

WATER SUPPLY RELIABILITY AND WATER SHORTAGE CONTINGENCY PLANNING

This chapter describes the reliability of the City of Cotati's (City's) water supplies, including a discussion of the City's water shortage contingency plan, as well as potential supply disruptions associated with water quality issues and drought.

5.1 WATER SUPPLY RELIABILITY

The Urban Water Management Planning Act (UWMPA) requires that the Urban Water Management Plan (UWMP) address the reliability of the agency's water supplies. This includes a description of supplies that are vulnerable to seasonal or climatic variations.

Law

> *10631 (f). An urban water supplier shall describe in the plan water management tools and options used by that entity that will maximize resources and minimize the need to import water from other regions.*
>
> *10631 (c) (2). For any water source that may not be available at a consistent level of use, given specific legal, environmental, water quality, or climatic factors, describe plans to replace that source with alternative sources or water demand management measures, to the extent practicable.*

The reliability of the City's water sources is dependent on the SCWA's ability deliver water supplies based on flow from the Russian River. The City's wholesale water supply provided by SCWA is subject to dry year reductions, due to seasonal and climatic shortages, pursuant to the State Water Board's Decision 1610. Demand curtailments are required to be entailed by 30 percent for a portion of the year if the water volume in Lake Sonoma is less than 100,000 AF prior to July 15, per Decision 1610. As described in the SCWA 2010 UWMP, this condition has not been experienced on the Russian River system, but the SCWA modeling simulations for single-dry years predict that the storage levels in Lake Sonoma will fall below the 100,000 AF prior to July 15. Therefore, the SCWA projects that demand curtailments will be required for a portion of the year. Single-dry year reductions are predicted to reach 18 percent of normal demand by the year 2035. The SCWA does not project reductions for multiple-dry years. Shortage of water apportionment for water contractors, including the City, is governed by the allocation methodology of Section 3.5 of the Restructured Agreement for Water Supply.

The City can supplement possible SCWA supply reductions with groundwater use. The City's historic water use records show that groundwater levels have not declined and the City can reliably supply historic demands with the use of groundwater. The City is using an annual maximum extraction volume of 530 AFY for production capacity of their three groundwater wells, per the 2008 Luhdorff and Scalmanini report. Due to the storage volume available within the Santa Rosa Plain groundwater basin, it is not anticipated that

groundwater supply would be affected in multiple-dry years. This is further explained in Section 5.4, Drought Planning.

5.1.1 Resource Maximization/Import Minimization

The City recognizes the importance of maintaining a high quality reliable water supply. Although water is a renewable resource, there is a limit on the amount of water that can be sustainably drawn from a given supply source (e.g., groundwater basins, wholesale water). The main focus for the City is to maximize the efficient use of water and to promote conservation. This will be accomplished through the continued implementation of demand management measures (DMMs) that have been implemented by the City, as well as other conservation activities necessary to meet the City's conservation goals.

5.1.2 Factors Affecting Supply Reliability

There are a variety of factors that can impact water supply reliability. Factors impacting the City's supply sources are indicated with a "Yes" or "No" as appropriate in Table 5.1. A brief discussion on each of these factors is provided below.

Table 5.1 Factors Resulting in Inconsistency of Supply (Guidebook Table 29)
2010 Urban Water Management Plan
City of Cotati

Water Supply Sources	Specific Source Name	Limitation Quantification	Legal	Environmental	Water Quality	Climatic	Additional Information
Wholesale Agencies	SCWA	1,520 AFY(1)	Yes	Yes	No	Yes	Yes(1)
Supplier-Produced Groundwater	City Groundwater Wells	None	No	No	No	No	No
Supplier-Produced Surface Water	No Sources	--	--	--	--	--	--
Transfers In	No Sources	--	--	--	--	--	--
Exchanges In	No Sources	--	--	--	--	--	--
Recycled Water	Santa Rosa	None	No	No	No	No	Yes(2)
Desalinated Water	No Sources	--	--	--	--	--	--
Other	No Sources	--	--	--	--	--	--

Notes:

(1) Annual Entitlement Limit per section 3.1 of the Restructured Agreement for Water Supply (Appendix C).
(2) Recycled Water Feasibility Study (Appendix D).

A fundamental factor that affects water supply reliability is the hydraulic capacity of supply and distribution system facilities (e.g., groundwater wells, treatment facilities, transmission

mains). As the City continues to grow, it will construct the additional supply and distribution system facilities necessary to accommodate the increased water demands associated with this growth. For this reason, the physical capacity of the City's supply facilities is assumed to not be a limiting factor affecting the reliability of the City's supply in the future, as is not listed in Table 5.1.

5.1.2.1 Legal Factors

Legal factors, such as pumping limitations in adjudicated groundwater basins and surface water contracts, are capable of affecting the reliability of a water distribution system. As noted in Chapter 4, however, the Santa Rosa Plains Sub Basin is not an adjudicated groundwater basin. Therefore, there are no legal limitations on the amount of groundwater that the City can extract from this subbasin.

Restructured Agreement- Delivery entitlements established in the Restructured Agreement and allocated to the City are 1,520 acre-feet per year. The Agency's delivery obligations under the Restructured Agreement are subject to numerous conditions, many of which currently impact the Agency's ability to deliver water. Provisions for apportionment of water during periods of shortage are stipulated in the Restructured Agreement.

5.1.2.2 Environmental Factors

There is a heightened awareness of the impact on the California ecosystem from a variety of projects. As such, environmental concerns often arise during the water planning process. These concerns can, in turn, cause a lack of supply due to the enforcement of environmental legislation. The recent legal actions involving the Endangered Species Act in the Delta are an example of the clash between environmental concerns and water supply.

The City currently relies on groundwater and SCWA supplied water to meet its customers' demands. It is not expected that the City's groundwater supply will be limited due to the best available info on sustainable yield.

5.1.2.3 Water Quality Factors

The quality of water obtained from a surface water or groundwater source can be a limiting factor on the amount of water that can be obtained from that source. Water quality considerations specific to Cotati are summarized in detail in Section 5.3. As noted in this section, the City's current supply sources are capable of reliably meeting City demands.

The City will take the steps necessary to comply with all existing and future water quality regulations and to continue to provide reliable water service to its residents.

5.1.2.4 Climatic Factors

Climatic factors affecting the reliability of a given water supply system generally are a function of seasonal precipitation and runoff characteristics. Systems that rely primarily on surface water are particularly vulnerable to seasonal runoff. The City relies on supply from

SCWA and City groundwater wells. SCWA supply can have up to a 30 percent reduction during single dry-water years.

Not all dry years lead to water supply shortages and groundwater overdraft for groundwater supply sources. In an average or wet year, the water supply sources exceed the water demands. During extended drought periods, groundwater levels generally decline and will require more aggressive demand management practices to prevent overdraft conditions.. Therefore, the annual quantity of groundwater available to the City is not expected to vary significantly in relation to wet or dry years. The City's projected supply and demands associated with drought periods are discussed in greater detail in Section 5.4.

5.2 WATER SHORTAGE CONTINGENCY PLANNING

The UWMPA requires that the UWMP include an urban water shortage contingency analysis that addresses specified issues.

Law

10632 (a). (Describe) stages of action to be undertaken by the urban water supplier in response to water supply shortages, including up to a 50 percent reduction in water supply, and an outline of specific water supply conditions which are applicable to each stage.

10632 (c). Actions to be undertaken by the urban water supplier to prepare for, and implement during, a catastrophic interruption of water supplies including, but not limited to, a regional power outage, an earthquake, or other disaster.

10632 (d). Additional, mandatory prohibitions against specific water use practices during water shortages, including, but not limited to, prohibiting the use of potable water for street cleaning.

10632 (e). Consumption reduction methods in the most restrictive stages. Each urban water supplier may use any type of consumption reduction methods in its water shortage contingency analysis that would reduce water use, are appropriate for its area, and have the ability to achieve a water use reduction consistent with up to a 50 percent reduction in water supply.

10632 (f). Penalties or charges for excessive use, where applicable.

10632 (g). An analysis of the impacts of each of the actions and conditions described in subdivisions (a) to (f), inclusive, on the revenues and expenditures of the urban water supplier, and proposed measures to overcome those impacts, such as the development of reserves and rate adjustments.

10632 (h). A draft water shortage contingency resolution or ordinance.

10632 (i). (Provide) a mechanism for determining actual reductions in water use pursuant to the urban water shortage contingency analysis.

5.2.1 Stages of Action and Reduction Objectives

Water agencies relying on multiple supply sources, are much less likely to experience water shortages than those agencies relying primarily on surface water. The City currently relies on groundwater and wholesale water from SCWA.

The City has developed a three-stage rationing plan that will be invoked during declared water shortages. Each stage includes a water reduction objective, in percent of normal water demands. The rationing plan is dependent on the cause, severity, and anticipated duration of the water supply shortage. The first stage is in response to a 10 percent shortage and calls for a voluntary reduction in water consumption by 10 percent. The second and third stages of action include mandatory water conservation actions for water consumption reductions of 20 percent and 30 percent, respectively. Table 5.2 outlines the stages of action.

Table 5.2 Water Shortage Contingency - Rationing Stages (Guidebook Table 35)
2010 Urban Water Management Plan
City of Cotati

Stage	Reduction Objective
1 - Voluntary Conservation	10% reduction in total water demands from baseline
2 - Mandatory Conservation	20% reduction in total water demands from baseline
3 - Mandatory Conservation	30% reduction in total water demands from baseline

Note:
(1) Source: City of Cotati Municipal Code Chapter 13.30 Water Shortage Contingency Plan (Appendix E).

5.2.1.1 Administration of Water Shortage Program

The administration of a water shortage program would involve coordination among a number of City departments. The City Council, upon recommendation by the City Manager, has the authority to declare a state of water shortage based on climate or other conditions. A water shortage stage shall also be declared (Stage 1, 2, or 3) based on the severity of the water shortage.

5.2.2 Actions During a Catastrophic Interruption

The UWMPA requires each supplier to create a Catastrophic Supply Interruption Plan to ensure the readiness for emergencies occurring in the water system. The City's Emergency Response Plan (ERP) identifies the emergency planning, organization, and response policies required during and emergency. The ERP includes a concept of recovery operations, a hazard analysis, responsibilities, and department standard operating procedures for emergency response. Because several of the hazards identified in the ERP could result in a catastrophic interruption of water supplies, the ERP provides the actions

that the City would need to implement to minimize impacts of supply interruption. A general summary of the hazards identified in the City's ERP related to the water system are provided in Table 5.3.

Table 5.3 Catastrophic Supply Interruption Plan Hazards
2010 Urban Water Management Plan
City of Cotati

Hazard Type	Threat
Natural	Earthquake Flood Wildfires Landslides Extreme Weather
Technological/Man-Made	Dam Failure Hazardous materials Spill or contamination Major vehicle accident Train accident Airplane crash
Domestic Security Threats	Civil unrest Terrorism

Notes:
(1) Source: City of Cotati 2006 UWMP (Section 9.7).

The City's response to disasters is based on four phases as stated below:

1. Increased readiness;
2. Initial response operations;
3. Extended response operations; and
4. Recovery operations.

With the response to each phase, actions shall be taken to reduce and/or eliminate the threat of disaster situations and help reduce the lasting effects during recovery operations. This will take the participation of all agencies in the City's disaster response team, including the large responsibilities of the Public Works Department.

5.2.3 Mandatory Prohibitions on Water Wasting

Mandatory compliance measures enacted during a water shortage are more severe than voluntary measures, produce greater savings, and are less costly to the utility. The principal drawback to these measures is the customer resentment if the measures are not seen as equitable. Therefore, such measures need to be equitable and accompanied by a good public relations campaign.

Mandatory measures may include:

- Ordinances making water waste illegal
- Ordinances controlling landscape irrigation
- Ordinances restricting non-irrigation outdoor water uses
- Prohibitions on new connections or the incorporation of new areas
- Rationing

The City currently enforces Municipal Code Section 13.30.060 Water waste prohibitions. This code specifies certain water use prohibitions described in Table 5.4. In addition, the City may implement additional consumption reduction methods during Water Conservation Stages 1, 2, and 3, as summarized in Section 5.2.4. The City Council may by resolution declare conservation Stage 2 or 3 upon recommendation by the City Manager based on water supply and delivery projections by the City Engineer that an overall system-wide reduction of twenty percent or more is necessary, taking into consideration projections and estimates made by the Sonoma County Water Agency pertaining to the Russian River water supply.

5.2.4 Consumption Reduction Methods in Most Restrictive Stage

During conservation stage 1, in order to accomplish 10 percent water use reduction, public outreach will be implemented. Informing water users of the shortage stage, the cause of the shortage, and voluntary prohibitions would be included in utility bill stuffers and in public notices placed at public buildings and in the local newspaper. These outreach efforts will be repeated and ongoing for the duration of the water storage. Other mandated restrictions in water use for all reductions stages, including Stage 3, will be determined by the City Council, and may include the actions described in Table 5.5.

5.2.5 Excessive Use Penalties

Customers violating the regulations and restrictions on water use set forth in the Water Code shall receive actions by the City, as summarized in Table 5.6. The violation of each provision of this chapter, and each separate violation thereof, shall be deemed a separate offense, and shall be enforced as an infraction punishable by a fine in the amount provided by Government Code Section 36900, as amended. The city may, after written notification to customers and a reasonable time to correct the violation as solely determined by the city, take some or all of the following actions. Fees and charges for the activities below shall be established by resolution of the City council.

Table 5.4 Water Shortage Contingency - Mandatory Prohibitions (Guidebook Table 36) 2010 Urban Water Management Plan City of Cotati		
Stage	**Prohibitions**	**Stage When Prohibition Becomes Mandatory**
1	• Washing Sidewalks, driveways, and other hard surfaces • Excessive plumbing leaks not repaired • Excessive irrigation run-of • Washing cars without a shutoff valve on hose • Water for single-pass evaporative cooling systems • Water for new non-recirculating industrial clothes washers • Irrigation during the hottest part of the day	2
2	• Stage 1 prohibitions become mandatory in stage 2 • Refilling or initial filling of a swimming pool. • Noncommercial washing of privately owned motor vehicles, trailers and boats except from a bucket and except that a hose equipped with a shutoff nozzle may be used to rinse the vehicle. • Any use of water from a fire hydrant except for fighting fires or essential construction needs. • Use of potable water for dust control at construction sites.	2
3	• Watering any residential lawn or any commercial or industrial area lawn irrigated with potable water, at any time, day or night. • Planting any new landscaping, or any commercial or industrial area lawn irrigated with potable water, at any time, day or night. • All day and night-time irrigation sprinkling unless only a hand-held nozzle is used. An exception will be made to permit drip irrigation for established perennial plants and trees using manual or automatic time-controlled water application. • Planting of new annual plants, vegetables, flowers or vines may not occur until the Stage 3 emergency is over.	3
Note: (1) Source: City of Cotati Municipal Code Chapter 13.30 Water Shortage Contingency Plan (Appendix E).		

Table 5.5 Water Shortage Contingency - Consumption Reduction Methods (Guidebook Table 37) 2010 Urban Water Management Plan City of Cotati					
Stage	**Public Outreach**	**Drive-by Inspections**	**Rate(4) Increase for High Use**	**Penalties**	**Projected Reductions(1)**
1	X				10%
2	X	X	X	X	20%
3	X	X	X	X	30%

Notes:
(1) Source: City of Cotati Municipal Code Chapter 13.30 Water Shortage Contingency Plan (Appendix E).
(2) Consumption reduction measures will be implemented by the City as appropriate given the nature of the water supply shortage.
(3) Projected reductions, when implemented in concert, should be capable of achieving a system wide reduction of 30 percent.
(4) Excessive use fee.

A customer that has been assessed a penalty for violating or exceeding the water use allocation will have the right to a review of the penalty by the City Manager. A customer notified that a flow restrictor will be installed for exceeding the water use allocation will have the right to a review by the City Manager.

These reviews will be held if the customer files a written request for review with the City within 15 days after receipt of notification. The review will be held within a reasonable time after receipt of the request thereof.

5.2.6 Revenue and Expenditure Impacts/Measures to Overcome Impacts

Although revenues would decrease due to a decrease in water use, there would be some corresponding decrease in expenditures due to reductions in water pumping and treatment chemical use. Table 5.7 shows the revenue reductions resulting in water use conservation.

During a water shortage, it is estimated that an increase in public outreach would cost between $5,000 and $10,000 depending on the stage of conservation. This would cover the costs implied by advertisements placed in the local newspaper, notices in water bills to inform the public about stages of conservation, and other public outreach required to obtain the necessary reductions. There should be no increase in staff needed or additional treatment costs incurred.

Table 5.6	Water Shortage Contingency - Penalties and Charges (Guidebook Table 38) 2010 Urban Water Management Plan City of Cotati	
Violation Occurrence	**Penalty/Charge**	**Stage When Penalty Takes Effect**
1	• Written notice to the customer of the water waste violation including a specified period of time to correct violation.	Stage 2
2	• Personal contact with the customer at the address of the water service. If personal contact is unsuccessful, written notice of the violation including a date that the violation is to be corrected may be left on the premises, with a copy of the notice sent by certified mail to the customer.	Stage 2
3	• After notice and a hearing provided in accordance with section 13.30.100 of this chapter, the city council may authorize the installation of a flow restricting device on the service line and require payment of a fee in the amount set by city council resolution.	Stage 3
4	• The city council may levy a water waste fee to the customer, such fee established by separate ordinance.	Stage 3
5	• After notice and a hearing provided in accordance with Section 13.30.100 of this chapter, the city council may authorize termination of water service if such action is deemed by the city attorney to be allowable under statutory requirements at the time, and the charge for same shall be billed to the customer. Except in cases of emergency as solely determined by the manager, service shall not be reinstated until verified by the manager that the violation has been corrected and all charges and fees have been paid.	Stage 3

Notes:

(1) Source: City of Cotati Municipal Code Chapter 13.30 Water Shortage Contingency Plan (Appendix E).

Table 5.7 Revenue and Expenditure Impacts 2010 Urban Water Management Plan City of Cotati	
Stage	**Anticipated Revenue Reduction**
1 – 10% water reduction	• 5% revenue decrease
2 – 20% water reduction	• 12.5% revenue decrease
3 – 30% water reduction	• 35% revenue decrease
End of Water Shortage Emergency - 10% water reduction	• 5% revenue decrease
(1) Source: City of Cotati 2006 UWMP (Table 9-6).	

The proposed measures used to overcome the impacts imparted by revenue losses and increased expenditures during crisis situations are shown in Table 5.8.

Table 5.8 Revenue Recovery Measures 2010 Urban Water Management Plan City of Cotati	
Measures	**Effects**
Excess Use Penalty	• Minimal
Contingency Reserve	• 25% of annual revenue maintained
Temporary Tiered Rates	• Compensate for losses not covered by reserve rate
(1) Source: City of Cotati 2006 UWMP (Table 9-8).	

The City currently has operating cash reserves which can be used in the event of a revenue shortfall. These reserves would be supplemented with a temporary tiered rate in order to provide incentives for additional conservation and to make up for lost revenue.

5.2.7 Water Shortage Contingency Ordinance

The City adopted its water shortage contingency plan in 2005 with adoption of ordinance 778 as part of the Municipal Code Chapter 13.30 found in Appendix E.

5.2.8 Reduction Measuring Mechanism

The City's water system is supplied by the groundwater wells and two connections to SCWA. During a drought, water consumption would be monitored by City-Wide tracking through monthly meter readings and monthly production tracking. Each of the wells and SCWA turnouts includes a flow monitoring devise that records the amount of water entering the City's distribution system. The City will use these devices to monitor the citywide actual reductions in water use.

5.3 WATER QUALITY

The UWMPA requires that the UWMP include a discussion of the water quality impacts on an agency's supply reliability.

Law

> *10634. The plan shall include information, to the extent practicable, relating to the quality of existing sources of water available to the supplier over the same five-year increments as described in subdivision (a) of Section 10631, and the manner in which water quality affects water management strategies and supply reliability.*

In 2006, the United States Environmental Protection Agency (EPA) published the Ground Water Rule (GWR), which contains measures to establish multiple barriers to further protect against bacteria and viruses in drinking water from the groundwater sources. The GWR specifies when corrective action is required to further protect consumers serviced by groundwater systems from bacteria and viruses. In California, groundwater has long been considered free of sanitary contamination.

The City has not historically had water quality issues from any of their three groundwater wells. Furthermore, the City has not identified any specific water quality issues that will affect the City's ability to reliably provide high quality water to its residents. For this reason, the potential supply impacts listed in Table 5.9 are listed as "0."

Table 5.9 Water Quality - Current and Projected Water Supply Impacts (Guidebook Table 30)
2010 Urban Water Management Plan
City of Cotati

Water Source	Description of Condition	Potential Supply Impacts (AFY)					
		2010	2015	2020	2025	2030	2035
Supplier-Produced Groundwater	None	0	0	0	0	0	0

5.4 DROUGHT PLANNING

The UWMPA requires that an UWMP include water supply and demand projections for normal, single-dry year, and multiple-dry years.

Law

10631 (c) (1). Describe the reliability of the water supply and vulnerability to seasonal or climatic shortage, to the extent practicable, and provide data for each of the following: (A) an average water year, (B) a single dry water year, (C) multiple dry water years.

10632 (b). (Provide) an estimate of the minimum water supply available during each of the next three water years based on the driest three-year historic sequence for the agency's water supply.

10635 (a). Every urban water supplier shall include, as part of its urban water management plan, an assessment of the reliability of its water service to its customers during normal, dry, and multiple dry water years. This water supply and demand assessment shall compare the total water supply sources available to the water supplier with the total projected water use over the next 20 years, in five-year increments, for a normal water year, a single dry water year, and multiple dry water years. The water service reliability assessment shall be based upon the information compiled pursuant to Section 10631, including available data from state, regional, or local agency population projections within the service area of the urban water supplier.

This section considers the City's water supply reliability during three climate-related water scenarios: normal water year, single dry water year, and multiple dry water years. These scenarios are defined as follows:

- **Normal Year**: The normal year is a year in the historical sequence that most closely represents rainfall levels and patterns. The supply quantities for this condition are derived from historical average annual yields.
- **Single Dry Year**: This is defined as the year with the minimum useable supply. The supply quantities for this condition are derived from the minimum historical annual yield.
- **Multiple Dry Years**: This is defined as the three consecutive years with the minimum useable supply. Water systems are more vulnerable to these droughts of long duration, because they deplete water storage reserves in local and state reservoirs and in groundwater basins. The supply quantities for this condition are derived from the minimum of historical three-year running average annual yields.

Historically, the City's water supply has consisted largely on both City groundwater and groundwater from the SCWA. The City's wholesale water supply provided by SCWA is subject to dry year reductions due to seasonal and climatic shortages. The City can supplement possible SCWA supply reductions with groundwater use. The City's historic water use records show that groundwater levels have not declined and the City can reliably supply historic demands with the use of groundwater.

In order to determine the basis of hydrologic years, presented in Table 5.10, rainfall data was used from 1905 to 2010.

Table 5.10 Basis of Water Year Data (Guidebook Table 27) 2010 Urban Water Management Plan City of Cotati	
Water Year Type	**Base Year(s)**
Normal Water Year	1962
Single Dry Water Year	1977
Multiple Dry Water Years	1990 – 1992
Notes: (1) Source: California Data Exchange Center, Santa Rosa Station (1905-2010)..	

5.4.1 Basis of Water Year Data

Historical rainfall data available for the Santa Rosa Station from the California Exchange Center (CDEC)[1] was examined to establish a basis of water year for normal, single dry, and multiple dry years. As shown in Table 5.10, for the purposes of this report, the year 1962 is classified as a "normal" year, the year 1977 is classified as a "single dry" year, and the years 1990 to 1992 are classified as "multiple dry" years.

5.4.2 Supply Reliability - Historic and Current Conditions

Historically the City has seen very little interruptions in water sources because they are 100 percent redundant for supply sources. If the SCWA supplies are low due to drought conditions, then the wholesale water can be supplemented with pumping from the three City wells.

Table 5.11 presents calculations showing the percentage of rainfall for the hydrologic years shown in Table 5.11. The percentages provided in Table 5.11 were developed by comparing the normal year rainfall to the single and multiple drought years' rainfall.

During drought years, water use patterns will typically change. Outdoor water use will typically increase as irrigation is used as a replacement for decreased rainfall. However, this increase can be offset, at least in part, by increased conservation measures. To determine the impact of drought years on the City's annual demands, the City's historical per capita water usage was evaluated. By normalizing water consumption with population and thus expressing consumption in gpcd, the increase in demands due to growth is eliminated.

[1] Source: California Data Exchange Center, Santa Rosa Station (http://cdec.water.ca.gov).

Table 5.11 Supply Reliability - Historical Conditions (Guidebook Table 28) 2010 Urban Water Management Plan City of Cotati					
			Multiple Dry Years		
Supply Source	Average/ Normal Year (1962)	Single Dry Year (1976)	1988	1989	1990
Santa Rosa Station Rainfall (Inches)(1)	29	11	19	22	19
% of Normal	100.00%	38%	66%	76%	66%

Notes:

(1) Source: California Data Exchange Center, Santa Rosa Station (Rainfall Data inches 1905-2010).

The historical per-capita consumption was available for the period 1995 through 2010 and is shown in Figure 5.1. It can be seen in the figure that per-capita demand has trended downward. Overall, there was a slight increase in per capita water use in the City in the mid 1990s, followed by a more gradual decrease since the year 2000. To account for this downward trend, a linear fit trend line was developed. As shown in Figure 5.1, the per capita consumption in 2000 was about 13 percent above the linear trend. This year is considered indicative of the potential variation in water demands on an annual basis. For conservative planning purposes, it is appropriate to increase water demands by this percentage for the single dry and multiple dry hydrologic years. Based on these conservative planning assumptions, the City's current supply reliability is summarized in Table 5.12. The "Normal Year" water use for Table 5.12 was calculated by multiplying the City's 2010 population (7,711) by the City's baseline per capita water use of 158 gpcd. This equates to an annual volume of 1,365 AFY for a "normal" condition. Note that the City's actual 2010 water use was somewhat less than this value (981 AFY).

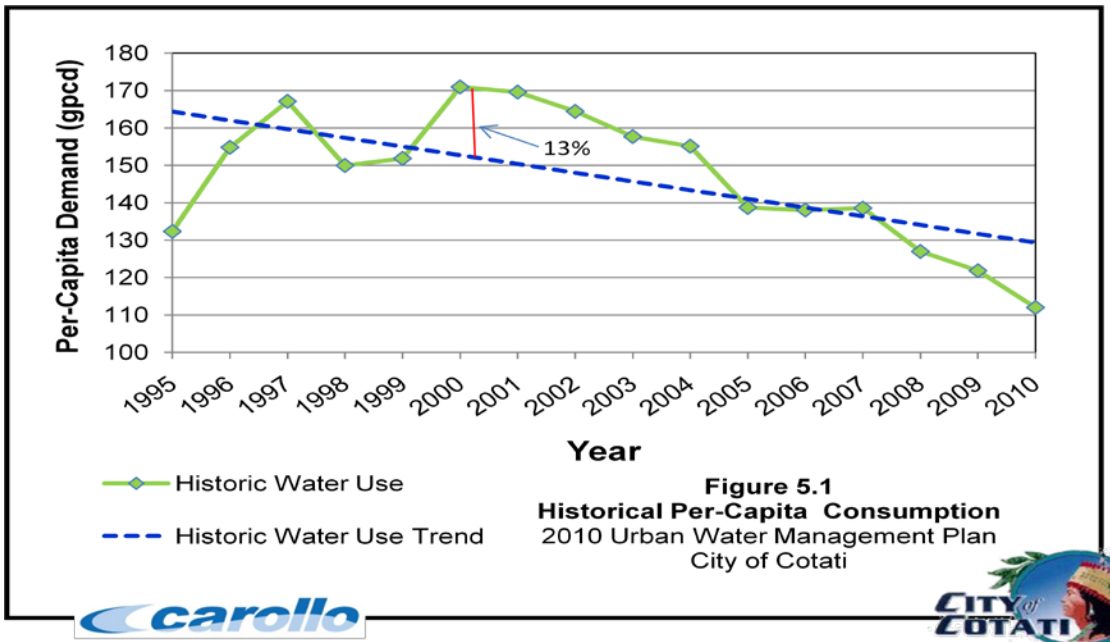


Figure 5.1
Historical Per-Capita Consumption
2010 Urban Water Management Plan
City of Cotati

The City is projected to be 100 percent redundant for their water supply. Although the SCWA is projecting approximately 18 percent and may impose up to a 30 percent water use reduction during a single dry year. The City's groundwater wells can supply the difference. This is shown in Table 5.12. SCWA does not anticipate that there will be supply reductions during multiple dry years.

Table 5.12 Supply Reliability - Current Water Source (Guidebook Table 31)
2010 Urban Water Management Plan
City of Cotati

Supply Source	Water Use (AFY)				
	Average/ Normal Year[(1)]	Single Dry Year[(2)]	Multiple Dry Years		
			Year 1	Year 2	Year 3
SCWA Water	983	806	1,108	1,108	1,108
% of Normal	**72%**	**60%**	**81%**	**81%**	**81%**
City Wells	382	723	431	431	431
% of Normal	**28%**	**53%**	**32%**	**32%**	**32%**
Total	100%	113%	113%	113%	113%

Notes:
(1) Normal Year based on 2010 population (7,711) and 10-year baseline use of 158 gpcd.
(2) Based on SCWA reductions of 18 percent on single dry years. Increased City groundwater due to SCWA reductions.

5.4.3 Projected Normal Year Supply/Demand

The normal year water demands through 2035 are estimated based on the per capita water use targets summarized in Chapter 3 and populations presented in Chapter 2. The projected normal water year water supply and demand projections are provided in Table 5.13.

Table 5.13 Supply and Demand Comparison - Normal Year (Guidebook Table 32)
2010 Urban Water Management Plan
City of Cotati

Supply/Demand Condition	Projected Supply/Demand (AFY)				
	2015	2020	2025	2030	2035
Supply Totals (from Guidebook Table 16)	1,024	1,055	1,142	1,253	1,340
Demand totals (From Guidebook Table 11)	1,024	1,055	1,142	1,253	1,340
Supply and Demand Difference	0	0	0	0	0
Difference as % of Supply	0%	0%	0%	0%	0%
Difference as % of Demand	0%	0%	0%	0%	0%

5.4.4 Projected Single Dry Year Supply/Demand

The projected single dry year water demands through 2035 are estimated based on the normal year demands, the anticipated demand and supply increase (13 percent). The projected single dry water year supplies and demands are presented in Table 5.14 As shown in Table 5.14, the projected supplies and demands are equal to normal supply, because the City's supply source is 100 percent redundant.

Table 5.14 Supply and Demand Comparison - Single Dry Year (Guidebook Table 33)
2010 Urban Water Management Plan
City of Cotati

Supply/Demand Condition	Projected Supply/Demand (AFY)				
	2015	2020	2025	2030	2035
Supply Totals	1,157	1,192	1,290	1,416	1,514
Demand totals	1,157	1,192	1,290	1,416	1,514
% of Normal Demand	113%	113%	113%	113%	113%
Supply and Demand Difference	0	0	0	0	0
Difference as % of Supply	0%	0%	0%	0%	0%
Difference as % of Demand	0%	0%	0%	0%	0%

5.4.5 Projected Multiple Dry Year Supply/Demand

The projected multiple dry year water demands through 2035 are estimated based on the normal year demands and the anticipated demand and supply increase (13 percent). The projected multiple dry water year supplies and demands are presented in Table 5.15. As shown in Table 5.15, the projected supplies and demands are equal, because the City's supply source is 100 percent redundant.

Table 5.15 Supply and Demand Comparison - Multiple Dry Year Events (Guidebook Table 34) 2010 Urban Water Management Plan City of Cotati							
Year		Supply/Demand Condition	Projected Supply/Demand (AFY)				
			2015	2020	2025	2030	2035
Multiple-Dry Year	1st Year Supply	Supply Totals	1,157	1,192	1,290	1,416	1,514
		Demand totals	1,157	1,192	1,290	1,416	1,514
		% of Normal Demand	113%	113%	113%	113%	113%
		Supply and Demand Difference	0	0	0	0	0
		Difference as % of Supply	0%	0%	0%	0%	0%
		Difference as % of Demand	0%	0%	0%	0%	0%
	2nd Year Supply	Supply Totals	1,157	1,192	1,290	1,416	1,514
		Demand totals	1,157	1,192	1,290	1,416	1,514
		% of Normal Demand	113%	113%	113%	113%	113%
		Supply and Demand Difference	0	0	0	0	0
		Difference as % of Supply	0%	0%	0%	0%	0%
		Difference as % of Demand	0%	0%	0%	0.00%	0%
	3rd Year Supply	Supply Totals	1,157	1,192	1,290	1,416	1,514
		Demand totals	1,157	1,192	1,290	1,416	1,514
		% of Normal Demand	113%	113%	113%	113%	113%
		Supply and Demand Difference	0	0	0	0	0
		Difference as % of Supply	0%	0%	0%	0%	0%
		Difference as % of Demand	0%	0%	0%	0%	0%

Chapter 6

DEMAND MANAGEMENT MEASURES

The UWMPA identifies fourteen Demand Management Measures (DMM) for urban water suppliers to address. These measures are derived from the original BMPs established in the UWMPA and the 1991 Memorandum of Understanding.

Law

10631 (f) (1) and (2). (Describe and provide a schedule of implementation for) each water demand management measure that is currently being implemented, or scheduled for implementation, including the steps necessary to implement any proposed measures, including, but not limited to, all of the following: (A) water survey programs for single-family residential and multifamily residential customers; (B) residential plumbing retrofit; (C) system water audits, leak detection, and repair; (D) metering with commodity rates for all new connections and retrofit of existing connections; (E) large landscape conservation programs and incentives; (F) high-efficiency washing machine rebate programs; (G) public information programs; (H) school education programs; (I) conservation programs for commercial, industrial, and institutional accounts; (J) wholesale agency programs; (K) conservation pricing; (L) water conservation coordinator; (M) water waste prohibition; (N) residential ultra-low flush toilet replacement programs.

10631 (f) (3). (Provide) a description of the methods, if any, that the supplier will use to evaluate the effectiveness of water demand management measures implemented or described under the plan.

10631 (f) (4). (Provide) an estimate, if available, of existing conservation savings on water use within the supplier's service area, and the effect of the savings on the supplier's ability to further reduce demand.

10631 (g). (Provide) an evaluation of each water demand management measure listed in paragraph (1) of subdivision (f) that is not currently being implemented or scheduled for implementation. In the course of the evaluation, first consideration shall be given to water demand management measures, or combination of measures, that offer lower incremental costs than expanded or additional water supplies. This evaluation shall do all of the following: (1) Take into account economic and noneconomic factors, including environmental, social, health, customer impact, and technological factors; (2) Include a cost-benefit analysis, identifying total benefits and total costs; (3) Include a description of funding available to implement any planned water supply project that would provide water at a higher unit cost; (4) Include a description of the water supplier's legal authority to implement the measure and efforts to work with other relevant agencies to ensure the implementation of the measure and to share the cost of implementation.

In 1991, a Memorandum of Understanding (MOU) regarding Urban Water Conservation in California formed the California Urban Water Conservation Council (CUWCC). The City of Cotati (City) is currently a signatory of the MOU and is therefore a member of CUWCC.

The City realizes the importance of the Best Management Practices (BMPs) to ensure a reliable future water supply. The City is committed to the continued implementation of water conservation programs to maximize sustainability in meeting future water needs for its

customers. Further discussion is included in the City's CUWCC BMP Annual Reports (Appendix F). Due to the continued effective water conservation measures implemented by the City, the 2010 per-capita water use has dropped to roughly 112 gallons per capita per day (gpcd), from 171 gpcd in 2000 and 130 gpcd in 2005. (See Table 6.1.)

Table 6.1 Demand Management Measures
2010 Urban Water Management Plan
City of Cotati

Demand Management Measure	Implemented	Planned for Implementation	Not Applicable
BMP 1 - Water Survey Programs	✓		
BMP 2 - Residential Plumbing Retrofit	✓		
BMP 3 - Water System Audits	✓		
BMP 4 - Metering with Commodity Rates	✓		
BMP 5 - Landscape Irrigation Programs	✓		
BMP 6 - Washing Machine Rebate Program	✓		
BMP 7 - Public Information Program	✓		
BMP 8 - School Education Program	✓		
BMP 9 - Commercial, Industrial, and Institutional Conservation Programs	✓		
BMP 10 - Wholesale Agency Programs			✓
BMP 11 - Conservation Pricing	✓		
BMP 12 - Water Conservation Coordinator	✓		
BMP 13 - Water Waste Prohibition	✓		
BMP 14 - Ultra Low Flush Toilet Replacement	✓		

6.1 DMM 1 - WATER SURVEY PROGRAMS

This program consists of offering water audits to single-family and multi-family residential customers. Audit components include reviewing water usage history with the customer, identifying leaks inside and outside the home, and recommending improvements.

The City has two subcontractors under contract to perform residential water survey programs. The indoor survey consultant is a licensed plumber entering the water customer's house to evaluate their system for leaks, replacing faulty toilet valves, installing low-flow showerheads and faucet aerators. The outdoor water surveys include an

evaluation of the customer's irrigation efficiency and watering schedule. This may include assistance with programming irrigation controllers and recommendations for improving their irrigation system.

6.2 DMM 2 - RESIDENTIAL PLUMBING RETROFIT

This program consists of installing physical devices to reduce the amount of water used or to limit the amount of water, which can be served to the customer. In accordance with State Law, low flow fixtures have been required on all new construction since 1978. In addition, State legislation enacted in 1990 requires all new buildings after January 1, 1992 to install Ultra-Low Flush Toilets (ULFT).

Several studies suggest that savings resulting from miscellaneous interior retrofit fixtures can range between 25 and 65 gpd per housing unit. The studies also suggest that installation of retrofit fixtures in older single-family homes tend to produce more savings, while newer multi-family homes tend to produce fewer saving per housing unit.

High efficiency showerheads and faucet aerators are installed free-of-charge to residential customers through the residential survey program or the toilet retrofit program.

6.3 DMM 3 - SYSTEM WATER AUDITS, LEAK DETECTION, AND REPAIR

The City of Cotati continually checks for leaks in its system by responding immediately to customer calls on potential leaks, and visually checking for abnormal wet areas or green spots during routine work activities. The City also checks for leaks during bi-monthly meter reads by visually checking and listening for leaks, and by checking for abnormally high reads. The City also periodically hires professionals for leak detection surveys to investigate the water distribution system. To date, very few leaks have been found.

The City is in the process of performing pilot programs on automated meter reading systems. Automatic meter reading (AMR), while primarily installed for billing purposes, allows for real-time monitoring of customer-side leaks, vandalism, and top of the hour reads to get a clear picture of actual water losses. In addition, the AMR infrastructure allows for deployment of citywide system leak detectors, which is currently being explored.

For the future improvements, the City is investigating district metering in order to isolate problem areas and give priority to those areas with the highest apparent losses.

6.4 DMM 4 - METERING WITH COMMODITY RATES

This DMM requires that water meters be installed for all new connections to allow billing by volume of use. This program also applies to retrofitting any existing unmetered connections.

All City water accounts are metered and billed by volume.

6.5 DMM 5 - LARGE LANDSCAPE CONSERVATION PROGRAMS

This DMM calls for agencies to commence assigning reference evapotranspiration (ETo) based water budgets to accounts with dedicated irrigation meters and provide water-use large landscape water audits to commercial, industrial, and institutional (CII) customers with mixed-use meters.

The City has implemented a large landscape audit program by installing irrigation meters on all commercial and institutional water accounts.

6.6 DMM 6 - HIGH-EFFICIENCY WASHING MACHINE REBATE PROGRAM

This program provides financial incentives, typically in the form of rebate offers, to qualifying customers who install high-efficiency washing machines in their homes. The City continues to participate in the rebate program.

6.7 DMM 7 - PUBLIC INFORMATION PROGRAMS

This program consists of distributing information to the public through a variety of methods including brochures, radio and television, school presentations and videos, and web sites. Public outreach and education includes:

- A maintained water conservation web page on City's website;
- Water Wise Gardening compact discs (CD's), made available to City water customers;
- Notices to customers regarding specific programs, sent regularly through the water bill;
- Development and construction of a low-water use demonstration garden; and
- County-wide outreach (such as advertising and mailers) by the SCWA.

6.8 DMM 8 - SCHOOL EDUCATION PROGRAM

This DMM requires water suppliers to implement a school education program that includes providing educational materials and instructional assistance.

The City participates in school education programs through efforts with SCWA. The SCWA has comprehensive school programs that include in-classroom programs, field programs, and educational materials all of which are provided to the schools within the water service area for no fee. All programs and materials are grade-appropriate and meet California education standards.

6.9 DMM 9 - CONSERVATION PROGRAMS FOR CII ACCOUNTS

The City is planning to continue to implement additional CII programs in the future. Such programs typically involve turf fields, smart irrigation timers, and industrial process water use reductions. The City has implemented programs as described below:

- Commercial Clothes Washer Rebates
- Pre-Rinse Spray Valve Retrofit and Survey
- Commercial Toilet Retrofit Program

6.10 DMM 10 - WHOLESALE AGENCY PROGRAMS

This DMM applies to wholesale agencies and defines a wholesaler's role in terms of financial, technical, and programmatic assistance to its retail agencies implementing DMMs.

The City is not a wholesale agency, so this DMM does not apply.

6.11 DMM 11 - CONSERVATION PRICING

Conservation pricing is designed to discourage wasteful water habits and encourage conservation. The City's pricing structure contains multiple elements which comprise conservation pricing according to the CUWCC MOU's definition. All City water accounts are billed according to metered use, based on volume.

6.12 DMM 12 - WATER CONSERVATION COORDINATOR

The Water Conservation Coordinator is responsible for coordinating and expanding the City's water conservation program and providing residents with useful water conservation information.

The City Engineer is the City's designated Water Conservation Coordinator.

6.13 DMM 13 - WATER WASTE PROHIBITION

The City implemented an ordinance in November 2000, which prohibited the waste of water through prohibition of the following activities:

- Washing of sidewalks, driveways, and other outdoor surfaces

- Washing of external building or trailer walls
- Non-recirculating fountains
- Use of water from the City's distribution system for non-domestic purposes when another adequate source of water is available

6.14 DMM 14 - RESIDENTIAL ULTRA-LOW-FLUSH TOILET REPLACEMENT PROGRAMS

This program would provide incentives or ordinances requiring the replacement of existing toilets with ULFTs. State legislation requires the installation of efficient plumbing in new construction and, effective in 1994, requires that only ultra low flow toilets (ULFTs) be sold in California.

The City contracts with a professional plumber who installs up to two toilets per home free of charge to the water customer. The City has also passed ordinances in 2005 and 2006, requiring residential and commercial water customers to retrofit pre-1992 toilets to high efficiency toilets (HET) 1.28 gallon per flush units.

7.1 COMPLETED UWMP CHECKLIST

In order to expedite the review of the 2010 Urban Water Management Plans (UWMPs), the California Department of Water Resources (DWR) has developed a "Completed UWMP Checklist" that may be completed by urban water suppliers and included in their UWMPs. DWR offers two separate checklists with identical content, but which are organized differently. One version of the checklist is organized according to the Water Code legislative order. The other checklist is organized by topic, similar to the organization of DWR's Guidebook to Assist Urban Water Suppliers to Prepare a 2010 UWMP. Because the City of Cotati's (City's) 2010 UWMP is organized according to the recommended guidebook format, the completed UWMP checklist (Table 7.1) presented on the following pages is organized by topic. Values in ***blue italics*** represent values input for the City's 2010 UWMP in the standardized DWR table.

Table 7.1 Completed UWMP Checklist, Organized by Topic
2010 Urban Water Management Plan
City of Cotati

No.	UWMP Requirement [(1),(2)]	Calif. Water Code Reference	Additional Clarification	UWMP Location
PLAN PREPARATION				
4	Coordinate the preparation of its plan with other appropriate agencies in the area, including other water suppliers that share a common source, water management agencies, and relevant public agencies, to the extent practicable.	10620(d)(2)		*Ch. 1, Sec. 1.4 (pg. 1-3 to 1-4) & Table 1.1*
6	Notify, at least 60 days prior to the public hearing on the plan required by Section 10642, any city or county within which the supplier provides water that the urban water supplier will be reviewing the plan and considering amendments or changes to the plan. Any city or county receiving the notice may be consulted and provide comments.	10621(b)		*Ch 1, Sec 1.4 (pg. 1-5)*
7	Provide supporting documentation that the UWMP or any amendments to, or changes in, have been adopted as described in Section 10640 et seq.	10621(c)		*Ch. 1, Sec. 1.5.1 (pg. 1-5) & App. C*
54	Provide supporting documentation that the urban water management plan has been or will be provided to any city or county within which it provides water, no later than 60 days after the submission of this urban water management plan.	10635(b)		*Ch. 1, Sec. 1.5.2 (pg. 1-5) & App. D*
55	Provide supporting documentation that the water supplier has encouraged active involvement of diverse social, cultural, and economic elements of the population within the service area prior to and during the preparation of the plan.	10642		*Ch. 1, Sec. 1.4 (pg. 1-4) & Table 1.1*
56	Provide supporting documentation that the urban water supplier made the plan available for public inspection and held a public hearing about the plan. For public agencies, the hearing notice is to be provided pursuant to Section 6066 of the Government Code. The water supplier is to provide the time and place of the hearing to any city or county within which the supplier provides water. Privately-owned water suppliers shall provide an equivalent notice within its service area.	10642		*Ch. 1, Sec. 1.4 (pg. 1-4) & App. B*
57	Provide supporting documentation that the plan has been adopted as prepared or modified.	10642		*Ch. 1, Sec. 1.5.1 (pg. 1-5) & App. C*
58	Provide supporting documentation as to how the water supplier plans to implement its plan.	10643		*Ch. 1, Sec. 1.5.3 (pg. 1-5)*

Table 7.1 Completed UWMP Checklist, Organized by Topic
2010 Urban Water Management Plan
City of Cotati

No.	UWMP Requirement [(1),(2)]	Calif. Water Code Reference	Additional Clarification	UWMP Location
59	Provide supporting documentation that, in addition to submittal to DWR, the urban water supplier has submitted this UWMP to the California State Library and any city or county within which the supplier provides water supplies a copy of its plan no later than 30 days after adoption. This also includes amendments or changes.	10644(a)		*Ch. 1, Sec. 1.5.2 (pg. 1-5) & App. D*
60	Provide supporting documentation that, not later than 30 days after filing a copy of its plan with the department, the urban water supplier has or will make the plan available for public review during normal business hours	10645		*Ch. 1, Sec. 1.5.2 (pg. 1-5)*
SYSTEM DESCRIPTION				
8	Describe the water supplier service area.	10631(a)		*Ch. 2, Sec. 2.1 (pg. 2-1 to 2-6)*
9	Describe the climate and other demographic factors of the service area of the supplier	10631(a)		*Ch. 2, Sec. 2.1.3 (pg. 2-6)*
10	Indicate the current population of the service area	10631(a)	Provide the most recent population data possible. Use the method described in "Baseline Daily Per Capita Water Use." See Section M.	*Ch. 2, Sec. 2.2 (pg. 2-6)*
11	Provide population projections for 2015, 2020, 2025, and 2030, based on data from State, regional, or local service area population projections.	10631(a)	2035 and 2040 can also be provided to support consistency with Water Supply Assessments and Written Verification of Water Supply documents.	*Ch. 2, Sec. 2.2 (pg. 2-7 to 2-8)*
12	Describe other demographic factors affecting the supplier's water management planning.	10631(a)		*Ch. 2, Sec. 2.2 (pg. 2-4)*
SYSTEM DEMANDS				
1	Provide baseline daily per capita water use, urban water use target, interim urban water use target, and compliance daily per capita water use, along with the bases for determining those estimates, including references to supporting data.	10608.20(e)		*Ch. 3, Sec. 3.1 (pg. 3-1 to 3-9)*

Table 7.1 Completed UWMP Checklist, Organized by Topic
2010 Urban Water Management Plan
City of Cotati

No.	UWMP Requirement [(1),(2)]	Calif. Water Code Reference	Additional Clarification	UWMP Location
2	*Wholesalers:* Include an assessment of present and proposed future measures, programs, and policies to help achieve the water use reductions. *Retailers:* Conduct at least one public hearing that includes general discussion of the urban retail water supplier's implementation plan for complying with the Water Conservation Bill of 2009.	10608.36 10608.26(a)	Retailers and wholesalers have slightly different requirements	***Ch. 1, Sec. 1.3 (pg. 1-4)***
3	Report progress in meeting urban water use targets using the standardized form.	10608.40		***Not Applicable until 2015 UWMP***
25	Quantify past, current, and projected water use, identifying the uses among water use sectors, for the following: (A) single-family residential, (B) multifamily, (C) commercial, (D) industrial, (E) institutional and governmental, (F) landscape, (G) sales to other agencies, (H) saline water intrusion barriers, groundwater recharge, conjunctive use, and (I) agriculture.	10631(e)(1)	Consider 'past' to be 2005, present to be 2010, and projected to be 2015, 2020, 2025, and 2030. Provide numbers for each category for each of these years.	***Ch. 3, Sec 3.2 (pg. 3-9 to 3-18)***
33	Provide documentation that either the retail agency provided the wholesale agency with water use projections for at least 20 years, if the UWMP agency is a retail agency, OR, if a wholesale agency, it provided its urban retail customers with future planned and existing water source available to it from the wholesale agency during the required water-year types	10631(k)	Average year, single dry year, multiple dry years for 2015, 2020, 2025, and 2030.	***Not Applicable***
34	Include projected water use for single-family and multifamily residential housing needed for lower income households, as identified in the housing element of any city, county, or city and county in the service area of the supplier.	10631.1(a)		***Ch.3, Sec. 3.2.6 (pg. 3-17 to 3-18)***
SYSTEM SUPPLIES				
13	Identify and quantify the existing and planned sources of water available for 2015, 2020, 2025, and 2030.	10631(b)	The 'existing' water sources should be for the same year as the "current population" in line 10. 2035 and 2040 can also be provided.	***Ch. 4, Section 4.1 (pg. 4-1 to 4-9)***

Table 7.1 Completed UWMP Checklist, Organized by Topic
2010 Urban Water Management Plan
City of Cotati

No.	UWMP Requirement [1],[2]	Calif. Water Code Reference	Additional Clarification	UWMP Location
14	Indicate whether groundwater is an existing or planned source of water available to the supplier. If yes, then complete 15 through 21 of the UWMP Checklist. If no, then indicate "not applicable" in lines 15 through 21 under the UWMP location column.	10631(b)	Source classifications are: surface water, groundwater, recycled water, storm water, desalinated sea water, desalinated brackish groundwater, and other.	*Ch. 4, Sec. 4.1.1 (pg. 4-2) & Sec. 4.2 (pg. 4-9 to 4-13)*
15	Indicate whether a groundwater management plan been adopted by the water supplier or if there is any other specific authorization for groundwater management. Include a copy of the plan or authorization.	10631(b)(1)		*Ch. 4, Sec. 4.2.2 (pg. 4-11)*
16	Describe the groundwater basin.	10631(b)(2)		*Ch. 4, Sec. 4.2.1 (pg. 4-9 to 4-11)*
17	Indicate whether the groundwater basin is adjudicated? Include a copy of the court order or decree.	10631(b)(2)		*Ch. 4, Sec. 4.2.1 (pg. 4-10)*
18	Describe the amount of groundwater the urban water supplier has the legal right to pump under the order or decree. If the basin is not adjudicated, indicate "not applicable" in the UWMP location column.	10631(b)(2)		*Not Applicable*
19	For groundwater basins that are not adjudicated, provide information as to whether DWR has identified the basin or basins as overdrafted or has projected that the basin will become overdrafted if present management conditions continue, in the most current official departmental bulletin that characterizes the condition of the groundwater basin, and a detailed description of the efforts being undertaken by the urban water supplier to eliminate the long-term overdraft condition. If the basin is adjudicated, indicate "not applicable" in the UWMP location column.	10631(b)(2)		*Ch.4, Sec. 4.2.3 (pg. 4-12)*
20	Provide a detailed description and analysis of the location, amount, and sufficiency of groundwater pumped by the urban water supplier for the past five years	10631(b)(3)		*Ch. 4, Sec. 4.3 (pg. 4-12 to 4-13)*
21	Provide a detailed description and analysis of the amount and location of groundwater that is projected to be pumped.	10631(b)(4)	Provide projections for 2015, 2020, 2025, and 2030.	*Ch. 4, Sec. 4.3 (pg. 4-13)*
24	Describe the opportunities for exchanges or transfers of water on a short-term or long-term basis.	10631(d)		*Ch. 4, Sec. 4.4 (pg. 4-14)*

Table 7.1 Completed UWMP Checklist, Organized by Topic
2010 Urban Water Management Plan
City of Cotati

No.	UWMP Requirement [(1),(2)]	Calif. Water Code Reference	Additional Clarification	UWMP Location
30	Include a detailed description of all water supply projects and programs that may be undertaken by the water supplier to address water supply reliability in average, single-dry, and multiple-dry years, excluding demand management programs addressed in (f)(1). Include specific projects, describe water supply impacts, and provide a timeline for each project.	10631(h)		*Ch. 4, Sec. 4.7 (pg. 4-20 to 4-21)*
31	Describe desalinated water project opportunities for long-term supply, including, but not limited to, ocean water, brackish water, and groundwater.	10631(i)		*Ch. 4, Sec. 4.5 (pg. 4-14 to 4-15)*
44	Provide information on recycled water and its potential for use as a water source in the service area of the urban water supplier. Coordinate with local water, wastewater, groundwater, and planning agencies that operate within the supplier's service area.	10633		*Ch. 4, Sec. 4.6 (pg. 4-15 to 4-20)*
45	Describe the wastewater collection and treatment systems in the supplier's service area, including a quantification of the amount of wastewater collected and treated and the methods of wastewater disposal.	10633(a)		*Ch. 4, Sec. 4.6.1 (pg. 4-16 to 4-17)*
46	Describe the quantity of treated wastewater that meets recycled water standards, is being discharged, and is otherwise available for use in a recycled water project.	10633(b)		*Ch. 4, Sec. 4.6.1 (pg. 4-18 to 4-19)*
47	Describe the recycled water currently being used in the supplier's service area, including, but not limited to, the type, place, and quantity of use.	10633(c)		*Ch. 4, Sec. 4.6.2 (pg. 4-20)*
48	Describe and quantify the potential uses of recycled water, including, but not limited to, agricultural irrigation, landscape irrigation, wildlife habitat enhancement, wetlands, industrial reuse, groundwater recharge, indirect potable reuse, and other appropriate uses, and a determination with regard to the technical and economic feasibility of serving those uses.	10633(d)		*Ch. 4, Sec. 4.6.3 (pg. 4-20)*
49	The projected use of recycled water within the supplier's service area at the end of 5, 10, 15, and 20 years, and a description of the actual use of recycled water in comparison to uses previously projected.	10633(e)		*Ch. 4, Sec. 4.6.4 (pg. 4-20)*
50	Describe the actions, including financial incentives, which may be taken to encourage the use of recycled water, and the projected results of these actions in terms of acre-feet of recycled water used per year.	10633(f)		*Ch. 4, Sec. 4.6.4 (pg. 4-20)*

Table 7.1 Completed UWMP Checklist, Organized by Topic
2010 Urban Water Management Plan
City of Cotati

No.	UWMP Requirement [(1),(2)]	Calif. Water Code Reference	Additional Clarification	UWMP Location
51	Provide a plan for optimizing the use of recycled water in the supplier's service area, including actions to facilitate the installation of dual distribution systems, to promote recirculating uses, to facilitate the increased use of treated wastewater that meets recycled water standards, and to overcome any obstacles to achieving that increased use.	10633(g)		*Ch. 4, Sec. 4.6.4 (pg. 4-20)*
WATER SHORTAGE RELIABILITY AND WATER SHORTAGE CONTINGENCY PLANNING				
5	Describe water management tools and options to maximize resources and minimize the need to import water from other regions.	10620(f)		*Ch. 5, Sec. 5.1.1 (pg. 5-1)*
22	Describe the reliability of the water supply and vulnerability to seasonal or climatic shortage and provide data for (A) an average water year, (B) a single dry water year, and (C) multiple dry water years.	10631(c)(1)		*Ch. 5, Sec. 5.1.2 (pg. 5-1 to 5-3)*
23	For any water source that may not be available at a consistent level of use - given specific legal, environmental, water quality, or climatic factors - describe plans to supplement or replace that source with alternative sources or water demand management measures, to the extent practicable.	10631(c)(2)		*Ch. 5, Sec. 5.1.2 (pg. 5-1 to 5-3)*
35	Provide an urban water shortage contingency analysis that specifies stages of action, including up to a 50-percent water supply reduction, and an outline of specific water supply conditions at each stage	10632(a)		*Ch. 5, Sec. 5.2 (pg. 5-3 to 5-11)*
36	Provide an estimate of the minimum water supply available during each of the next three water years based on the driest three-year historic sequence for the agency's water supply.	10632(b)		*Ch. 5, Sec. 5.4.2. (pg. 5-14)*
37	Identify actions to be undertaken by the urban water supplier to prepare for, and implement during, a catastrophic interruption of water supplies including, but not limited to, a regional power outage, an earthquake, or other disaster.	10632(c)		*Ch. 5, Sec. 5.2.2 (pg. 5-8)*
38	Identify additional, mandatory prohibitions against specific water use practices during water shortages, including, but not limited to, prohibiting the use of potable water for street cleaning.	10632(d)		*Ch. 5, Sec. 5.2.3 & 5.2.4 (pg. 5-6 to 5-9)*

Table 7.1 Completed UWMP Checklist, Organized by Topic
2010 Urban Water Management Plan
City of Cotati

No.	UWMP Requirement [(1),(2)]	Calif. Water Code Reference	Additional Clarification	UWMP Location
39	Specify consumption reduction methods in the most restrictive stages. Each urban water supplier may use any type of consumption reduction methods in its water shortage contingency analysis that would reduce water use, are appropriate for its area, and have the ability to achieve a water use reduction consistent with up to a 50 percent reduction in water supply.	10632(e)		*Ch. 5, Sec. 5.2.4 (pg. 5-8 to 5-9)*
40	Indicated penalties or charges for excessive use, where applicable.	10632(f)		*Ch. 5, Sec. 5.2.5 (pg. 5-9 to 5-10)*
41	Provide an analysis of the impacts of each of the actions and conditions described in subdivisions (a) to (f), inclusive, on the revenues and expenditures of the urban water supplier, and proposed measures to overcome those impacts, such as the development of reserves and rate adjustments.	10632(g)		*Ch. 5, Sec. 5.2.6 (pg. 5-11)*
42	Provide a draft water shortage contingency resolution or ordinance.	10632(h)		*Ch. 5, Sec. 5.2.7 (pg. 5-11) & App. H*
43	Indicate a mechanism for determining actual reductions in water use pursuant to the urban water shortage contingency analysis.	10632(i)		*Ch. 5, Sec. 5.2.8 (pg. 5-11)*
52	Provide information, to the extent practicable, relating to the quality of existing sources of water available to the supplier over the same five-year increments, and the manner in which water quality affects water management strategies and supply reliability	10634	For years 2010, 2015, 2020, 2025, and 2030	*Ch. 5. Sec. 5.3 (pg. 5-11 to 5-12)*
53	Assess the water supply reliability during normal, dry, and multiple dry water years by comparing the total water supply sources available to the water supplier with the total projected water use over the next 20 years, in five-year increments, for a normal water year, a single dry water year, and multiple dry water years. Base the assessment on the information compiled under Section 10631, including available data from state, regional, or local agency population projections within the service area of the urban water supplier.	10635(a)		*Ch. 5, Sec. 5.4 (pg. 5-12 to 5-18)*

Table 7.1 Completed UWMP Checklist, Organized by Topic
2010 Urban Water Management Plan
City of Cotati

No.	UWMP Requirement [(1),(2)]	Calif. Water Code Reference	Additional Clarification	UWMP Location
DEMAND MANAGEMENT MEASURES				
26	Describe how each water demand management measures is being implemented or scheduled for implementation. Use the list provided.	10631(f)(1)	Discuss each DMM, even if it is not currently or planned for implementation. Provide any appropriate schedules.	***Ch. 6, Sec. 6.1 to 6.14 (pg. 6-1 to 6-6)***
27	Describe the methods the supplier uses to evaluate the effectiveness of DMMs implemented or described in the UWMP.	10631(f)(3)		***Ch. 6, Sec. 6.1 to 6.14 (pg. 6-1 to 6-6)***
28	Provide an estimate, if available, of existing conservation savings on water use within the supplier's service area, and the effect of the savings on the ability to further reduce demand.	10631(f)(4)		***Ch. 6, Sec. 6.1 to 6.14 (pg. 6-1 to 6-15)***
29	Evaluate each water demand management measure that is not currently being implemented or scheduled for implementation. The evaluation should include economic and non-economic factors, cost-benefit analysis, available funding, and the water suppliers' legal authority to implement the work.	10631(g)	See 10631(g) for additional wording.	***Not Applicable***
32	Include the annual reports submitted to meet the Section 6.2 requirements, if a member of the CUWCC and signer of the December 10, 2008 MOU.	10631(j)	Signers of the MOU that submit the annual reports are deemed compliant with Items 28 and 29.	***Appendix F***

Notes:
(1) The UWMP Requirement descriptions are general summaries of what is provided in the legislation. Urban water suppliers should review the exact legislative wording prior to submitting its UWMP.
(2) The Subject classification is provided for clarification only. It is aligned with the organization presented in Part I of this guidebook. A water supplier is free to address the UWMP Requirement anywhere with its UWMP, but is urged to provide clarification to DWR to facilitate review.

APPENDIX A – COORDINATION WITH RELEVANT AGENCIES

City of Cotati

Sonoma County, California

April 7, 2011

Sonoma County Water Agency
404 Aviation Boulevard
Santa Rosa, CA 95403

Attention: Grant Davis, General Manager

Subject: **Notice of Preparation of the 2010 City of Cotati Urban Water Management Plan (UWMP)**

Dear Mr. Davis:

Pursuant to the requirements of the California Water Code, Division 6, Part 2.6 Urban Water Management Planning, Section 10621 (b), every urban water supplier required to prepare a plan pursuant to this part shall, at least 60 days prior to the public hearing on the plan required by Section 10642, notify any city or county within which the supplier provides water supplies that the urban water supplier will be reviewing the plan and considering amendments or changes to the plan.

While the City of Cotati (City) is not an urban water retailer as defined by the California Water Code, the City currently intends to follow the Urban Water Management Planning process. This letter is to notify you that the City is in the process of preparing the 2010 UWMP. Based on the City's current schedule, we expect to have a public review draft of the 2010 UWMP available for review in May or June 2011, at which point your agency will receive a notification letter that the draft UWMP is available for public review.

If your agency would like to submit comments or provide input to the City in anticipation of the development of the 2010 UWMP, please submit written copies to:

Mr. Kevin Fredrickson, P.E.
Engineering Technician
City of Cotati
201 West Sierra Avenue
Cotati, CA 94931

Sincerely,

Mr. Damien O'Bid, P.E.,
City Engineer/Public Works Director

cc: Tommy Greci, Carollo Engineers, Inc.

APPENDIX B – URBAN WATER MANAGEMENT PLAN WATER DEMAND ANALYSIS AND WATER CONSERVATION MEASURES UPDATE (MADDAUS REPORT)

City of Cotati

FINAL 2010 Urban Water Management Plan Water Demand Analysis and Water Conservation Measures Update

November 16, 2010

MADDAUS
WATER
MANAGEMENT

TABLE OF CONTENTS

1. EXECUTIVE SUMMARY

1.1 Introduction

The 2010 Urban Water Management Plan demand and conservation technical analysis was conducted by Maddaus Water Management (MWM) for the City of Cotati. The purpose of the analysis was to:

1. Calculate a demand forecast for the year 2010 to 2035.
2. Calculate the range of conservation costs and savings for the year 2010 to 2035. This effort included:
    - Incorporate activity from current conservation measures for the year 2005 and 2009 into the DSS model.
    - Evaluate up to three new conservation measures that will reduce future water demand.
    - Estimate the costs and water savings of these measures.
    - Combine the measures into increasingly more aggressive programs and evaluate the costs and water savings of these programs.

1.2 Long-Term Demand and Conservation Program Analysis Results

The project for the Sonoma County Water Agency (SCWA) contractors included two main parts, (1) create a demand and conservation analysis for 2010 to 2035 and (2) evaluate conservation savings potential for the years 2010 to 2035 with a variety of different measures and conservation programs.

The first step in the analysis was to review and analyze historical water use production and billing data. For most contractors, the billing data was provided for the years 2000 to 2009 (a few contractors had data back to 1995 and one contractor has new meters, so data is only available after the year 2006). The data was graphically analyzed and discussed with the individual contractors. The historical water use along with the selected population and employment projections were used to create a demand forecast for the year 2010 to 2035.

Once the demands were completed, the conservation measures were analyzed for a total of 31 measures. The conservation analysis included all the measures from the 2005 conservation study that MWM completed for the SCWA contractors along with up to three new measures for each contractor. The following important assumptions about the conservation measures were included in this analysis:

1. Due to increased regulations and additional research and analysis on conservation measures, conservation measures Tier 2-8 (Reduced Connection Fees), Tier 2-9 (Synthetic Turf Rebate) and Tier 2-11 (Dishwasher Rebate) were removed from all programs at the request of the contractors.
2. No modifications to costs or savings assumptions were made to any of the Tier One and Tier Two Measures. To comply with new regulations and ordinances, minimal changes were made to the New Development measures ND-1 to ND-8
3. The table of the new measures for each contractor is listed in Section 5.1. An analysis of the new state law SB 407 was included for all contractors.
4. New development ordinances were updated to reflect new local ordinances, the Model Water Efficient Landscape Ordinance, and the Cal Green building code.

Table ES-1, ES-2 and ES-3 and Figure ES-1 show the water demands and conservation savings for the years 2010 to 2035. The Plumbing Code includes the new California State Law requiring High Efficiency Toilets and High Efficiency Urinals by 2014.

Table ES-1
Conservation Measures

City of Cotati Conservation Measures in each Program Measure Name	Program Existing	Program Existing & New	Program Tier One	Program Tier One & Tier Two	Program Tier One & ND	Program Tier One & ND & Tier Two
CUWCC #1a - Residential Water Surveys - Interior	✓	✓	✓	✓	✓	✓
CUWCC #1b - Residential Water Surveys - Outdoor	✓	✓	✓	✓	✓	✓
CUWCC #5a - Large Landscape Water Budgets	✓	✓	✓	✓	✓	✓
CUWCC #6 - Washer Rebates	✓	✓	✓	✓	✓	✓
CUWCC #7 - Residential Public Education	✓	✓	✓	✓	✓	✓
CUWCC #9 - Commercial Water Audits	✓	✓	✓	✓	✓	✓
CUWCC #14a - RSF Toilet Replacement	✓	✓	✓	✓	✓	✓
CUWCC #14b - RMF Toilet Replacement	✓	✓	✓	✓	✓	✓
Tier 2 - 1 Rain Sensor Retrofit				✓		✓
Tier 2 - 2 Cash for Grass				✓		✓
Tier 2 - 3 Financial Incentives for Being Below Water Budget				✓		✓
Tier 2 - 5a Smart Irrigation Controller Rebates - RSF				✓		✓
Tier 2 - 5b Smart Irrigation Controller Rebates - RMF, CII, IRR				✓		✓
Tier 2 - 6 Financial Incentives/Rebates for Irrigation Upgrades				✓		✓
Tier 2 - 10 High Efficiency Toilets				✓		✓
Tier 2 - 12 CII Rebates - Replace Inefficient Water Using Equipment				✓		✓
Tier 2 -13 New Commercial Urinals				✓		✓
Tier 2 - ND1 Rain Sensor Retrofit					✓	✓
Tier 2 - ND2 Smart Irrigation Controller	✓	✓			✓	✓
Tier 2 - ND3 High Efficiency Toilets	✓	✓			✓	✓
Tier 2 - ND4 Dishwasher New Efficient	✓	✓			✓	✓
Tier 2 - ND5 Clothes Washing Machine Requirement	✓	✓			✓	✓
Tier 2 - ND6 Hot Water on Demand					✓	✓
Tier 2 - ND7 High Efficiency Faucets and Showerheads	✓	✓			✓	✓
Tier 2 - ND8 Landscape and Irrigation Requirements	✓	✓			✓	✓
SB 407 Requirements (Plumbing Retrofit on Resale or Remodel)		✓				
Tiered Water Rates		✓				

NOTE – Due to increased regulations and additional research and analysis, conservation measures Tier 2-8, Tier 2-9 and Tier 2-11 are out of date and were removed from analysis at the request of all the contractors.

For additional information on Table ES-1, ES-2 and ES-3 see Section 6.1 and Section 6.2.

Figure ES-1
Long Term Demands with Conservation Programs

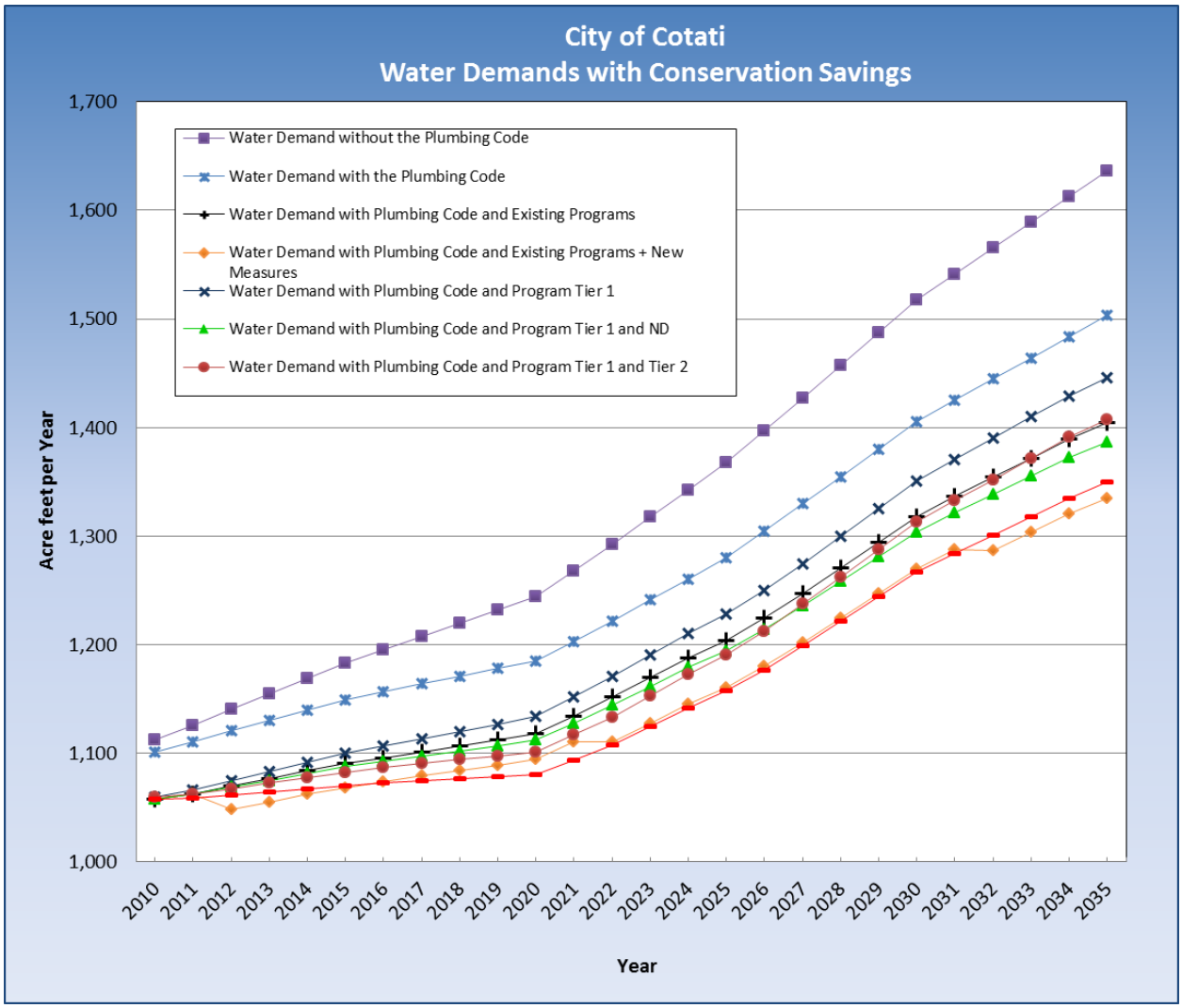


Table ES-2
Water Demand Projections

City of Cotati Water Demand with Conservation Program Savings						
Water Demand with Plumbing Code and Conservation Program Savings (AFY)	**2010**	**2015**	**2020**	**2025**	**2030**	**2035**
Water Demand without the Plumbing Code	1,113	1,183	1,244	1,367	1,517	1,636
Water Demand with the Plumbing Code	1,101	1,150	1,185	1,281	1,405	1,503
Water Demand with Plumbing Code and Existing Programs	1,058	1,091	1,118	1,204	1,318	1,405
Water Demand with Plumbing Code and Existing Programs + New Measures	1,058	1,069	1,095	1,161	1,270	1,335
Water Demand with Plumbing Code and Program Tier 1	1,060	1,100	1,134	1,228	1,351	1,446
Water Demand with Plumbing Code and Program Tier 1 and ND	1,058	1,088	1,112	1,195	1,304	1,387
Water Demand with Plumbing Code and Program Tier 1 and Tier 2	1,060	1,083	1,102	1,191	1,313	1,408
Water Demand with Plumbing Code and Program Tier 1 and ND and Tier 2	1,058	1,071	1,081	1,158	1,267	1,350

Table ES-3
Economic Analysis of Alternative Programs

City of Cotati Comparison of Conservation Program Costs and Savings									
Conservation Program	Water Utility Benefit-Cost Ratio	Community Benefit-Cost Ratio	2035 Water Savings (AFY)	2035 Indoor Water Savings (AFY)	2035 Outdoor Water Savings (AFY)	Total Water Savings as a % of Total Production in 2035	30 Year Present Value of Water Utility Costs ($1,000)	Total Utility Cost Five Years 2011-2015 ($1,000)	Utility Cost of Water Saved ($/AF)
Existing Program	2.27	0.74	99	42	56	6.57%	$456	$92	$223
Existing Program + New Measures	2.56	0.91	169	59	110	11.23%	$570	$137	$190
Tier One	1.88	2.22	58	21	37	3.85%	$425	$82	$281
Tier One + Tier Two	1.25	0.74	96	23	73	6.38%	$916	$388	$406
Tier One + New Development	2.42	0.64	116	54	63	7.75%	$466	$94	$206
Tier One + Tier Two + New Development	1.54	0.51	154	55	99	10.24%	$957	$401	$319

2. INTRODUCTION AND PURPOSE

The purpose of this report is to present an overview of the demand and conservation evaluation process which has been completed for the City of Cotati (City). The goal was to develop forecasts of demand and conservation savings for the 2010 Urban Water Management Plan.

The City of Cotati has a current water conservation program. This report evaluates whether expanding existing efforts is a cost-effective way to meet future water needs.

The conservation measures and programs were analyzed using the Least Cost Planning Water Demand Management Decision Support System (DSS Model). In this report demand management and water conservation are used interchangeably. The evaluation includes measures directed at existing accounts as well as new development measures to make new residential and business customers more water efficient. Six programs were provided to help evaluate the net effect of running multiple measures together over time. Assumptions and results for each of the 31 individual measures and six programs will be described in detail in this report.

2.1 Contents

This report provides a general overview for the methodology, assumptions, and results for the demand forecast and conservation analysis. The following information is included in this report and is discussed in individual sections below:

- Overview of evaluation process
- Baseline water demands with and without the plumbing code
- Comparison of individual conservation measures
- Results of the conservation analysis
- Conclusions
- Appendix A: Assumptions for the Conservation Measures Evaluated

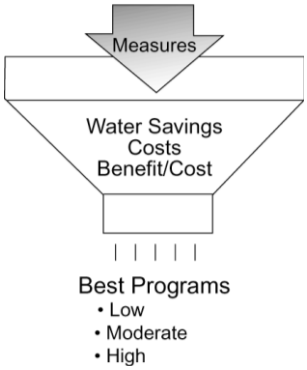
- Appendix B: Water Production and Billing Data Graphs for all Customer Categories

3. OVERVIEW OF EVALUATION PROCESS

Long Term Demand and Conservation Evaluation Process

During the evaluation process, water demand and savings were estimated. Benefits and costs were compared in a formal present value analysis and conclusions were drawn about which measures produce cost-effective water savings. The measure costs were previously developed by MWM and the contractors as part of the 2005 conservation study MWM completed for the SCWA contractors. This process can be thought of as an economic screening process, shown in Figure 1. Packaging the best measures into alternative programs allows the City of Cotati to consider what level of conservation implementation is appropriate.

Figure 1
Evaluation Process



Benefit-cost analysis has been used by many water agencies to evaluate and help select a water conservation measure best suited to local conditions. This analysis requires a locale-specific set of data, such as historical water consumption patterns by customer class, population projections, age of housing stock, and prior conservation efforts.

The following ten steps were used to implement the methodology by expanding upon the same DSS Model used to prepare the demand projections.

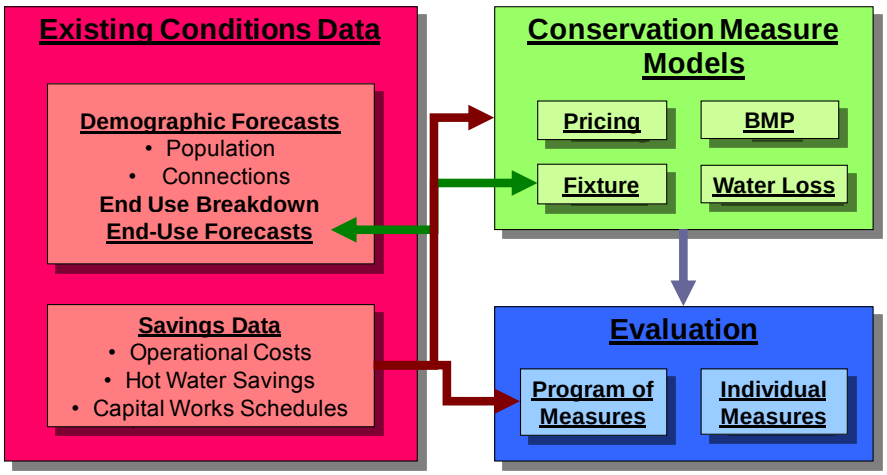
1. **Generate water use projections with and without the state and national plumbing code**. Projections cover each key customer category and are broken down into indoor and outdoor end uses. Evaluate the impact of the plumbing code changes arising from the 1992 and 2005 Federal Energy Policy Act. The plumbing code also includes fixture changes that will result from the State of California plumbing code which requires only high efficiency toilets and high efficiency urinals be sold in the state after the year 2014.
2. **Evaluate previous conservation measures and up to three new measures** to identify those that are applicable to the service area. Develop appropriate unit water savings and costs for each measure.
3. **Estimate the affected customers (or number of accounts) for each conservation measure** by dividing the measure's projected customers (or accounts) that implement the measure by the total service area customers (accounts). This factor is called the market penetration or installation rate.
4. **Estimate total annual average day water savings.** The water savings are computed by multiplying unit water savings, per measure, by the market saturation or installation rate (i.e.

10% to 90% of accounts), and then multiplying by the number of units in the service area (such as dwelling units) targeted by a particular measure. The indoor and outdoor water savings were also calculated.

5. **Identify benefits to the water agency** including potential reduced water purchases from SCWA, calculated as the wholesale water rate and delivery cost per acre-foot for each contractor with an escalator based on historical water rates and Consumer Price Index (CPI).
6. **Quantify total benefits for each year** in the planning period by multiplying average water savings for each measure by the computed value of the benefits.
7. **Determine initial and annual costs to implement the measures** based upon current conservation program data, local experience, and the costs of goods, services, and labor in the community. This is multiplied by the number of units participating each year and then added to overall administration and promotion costs to arrive at a total measure cost, which may be spread over a number of years. For this project the costs for all measures were used from the 2005 study, except for the three new measures selected by each contractor which had all new parameters developed.
8. **Compare costs of measures** by computing the present value of costs and costs of water saved over the planning period.
9. **Compile six programmatic packages** or programs containing various new and existing measures.
10. **Evaluate the six programs for water savings and cost-effectiveness** and identify the point of diminishing returns from further investments in conservation.

For conservation measure evaluation, the DSS Model performs economic analysis by using net present value and benefit-to-cost ratio as economic indicators. The benefit cost analysis is performed from various perspectives including the utility and community (community perspective equates to the utility plus customer). Figure 2 shows the structure of the model. Results are presented in subsequent sections.

Figure 2
Structure of the DSS Model



4. WATER DEMANDS WITH AND WITHOUT PLUMBING CODE

4.1 Future Population and Employment Projections

Description of Population and Employment Forecasts

There are generally three main sources of population and employment projections used to generate future water demands for the 2010 Urban Water Management Plans.

Available Demographic Projections

- *Local General Plan (population and employment)* – Typically these plans, depending upon when they were published, have a population and jobs forecast for 2030 and build out.
- *Association of Bay Area Governments (ABAG) (population and employment)* - ABAG recently published a new projections report in 2009 that includes population and employment estimates for each city in the Bay Area. This report provides estimates for 2000, 2005, 2010, 2015, 2020, 2025, 2030 and 2035. ABAG publishes demand projections every two years. The previous DSS Model projections, the ABAG Projections for 2005 2007, and 2009 were reviewed to determine the most appropriate data set to use in this DSS Model update.*Other Water Supply Planning Reports*

At the City of Cotati's request, the population projections were based on the 2007 City of Cotati Water Supply Assessment (WSA) and the employment projections were based on 2009 ABAG jurisdictional data as shown in Figure 3, 4 and Table 1 and 2. The values shown in the "Selected" column were used to create the demand projections. The current General Plan anticipates in-fill development constituting the vast majority of the development in this planning horizon. Development served by the City of Cotati utilities outside the current jurisdictional boundaries is expected to be minor. The 2007 WSA population projections were based on historical trends on new units created each year.

Figure 3
Population Projections

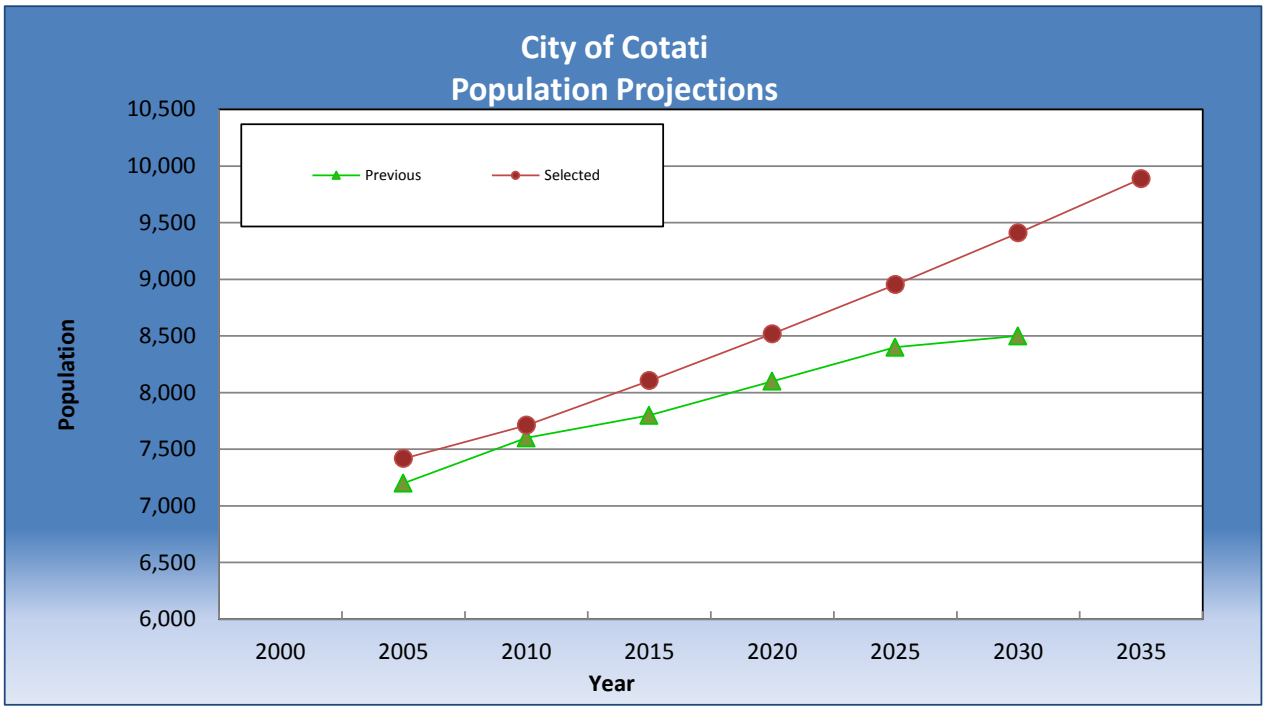


Table 1
Table of Population Projections

City of Cotati Population Projections		
Year	**Previous[1]**	**Selected[2,3]**
2000		
2005	7,200	7,418
2010	7,600	7,711
2015	7,800	8,105
2020	8,100	8,518
2025	8,400	8,953
2030	8,500	9,409
2035		9,889

Notes:

1) DSS Model data based on the 2005 ABAG jurisdictional data

2) Based on the Cotati Water Supply Assessment page 3-3 table 3-1

3) In 2007, Population was 7535 according to Cotati Water Supply Assessment page 3-3 table 3-1

Figure 4
Employment Projections

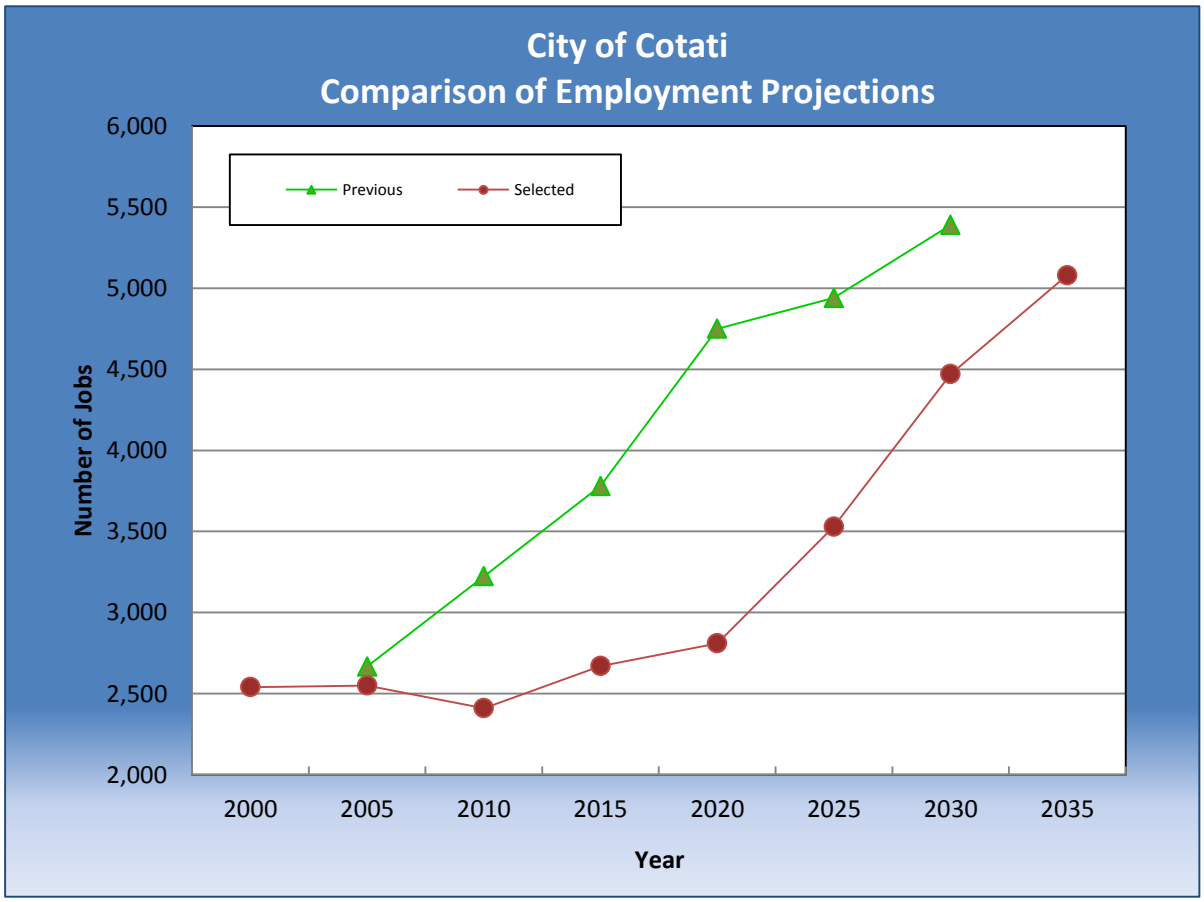


Table 2
Table of Employment Projections

City of Cotati Employment Projections		
Year	Previous[1]	Selected[2]
2000		2,540
2005	2,667	2,550
2010	3,224	2,410
2015	3,780	2,670
2020	4,750	2,810
2025	4,940	3,530
2030	5,390	4,470
2035		5,080

Notes:

1) DSS Model data based on the 2005 ABAG jurisdictional data

2) Based on ABAG 2009 Jurisdictional data

4.2 Water Use and Demographic Data Inputs to the Model

Description of "Water Use Data Input Sheet"

Figure 5 is a two-page print out of an Excel spreadsheet. The purpose of this "Water Use Data Input Sheet" is to gather and document basic information about the individual service area. The data shown on the "Water Use Data Input Sheet" can be broken into two main categories, (a) current water use data and (b) demographic data. Each area is broken out below and helps to provide some basic definitions and assumptions.

(a) Water Use Data

- *Model Start Year* – This is the starting year for the analysis. For this project, the start year for the model is 2005. The selection of 2005 as a model start year allowed the historical conservation efforts to be included for the past 5 years (2005 to 2009). The DSS Model includes 30 years of data projecting information until the year 2035.
- *Base Year for Future Water Factors* - Based on an analysis of historical water billing data, each contractor selected a year or average of multiple years that is representative of current water use and used as a base year demand factor for developing future water use projections. The year(s) was chosen by the contractors for the following reasons:
    1. The selected years shows less of an effect of the recession. For all contractors the years 2008 and 2009 show a dip in water demand in many areas due to reduction in economic activity.
    2. The years selected had relatively "normal" climate conditions – i.e. not a drought or excessively wet year, so no significant weather adjustments were necessary. For all contractors the years 2008 and 2009 were affected by drought conditions. The water billing or production data was not weather normalized for this analysis.
    3. Many contractors elected to average a few years of data for the analysis. Some contractors selected an individual year as they felt it was representative in terms of weather, vacancy, and customer water use for demand projection purposes.
    4. No additional adjustment factors were added other than the "new single family home category" for three of the contractors (City of Santa Rosa, Valley of the Moon and North Marin Water District). The adjustment was made based on analysis of actual data which showed an increase in water use for homes built since 2000.
- *Average gal/day/acct*- This is the amount of water in gallons that is used per day, per account.
- *Indoor/outdoor water use* – This is the amount of water per account split into the percent that is used indoors and outdoors.
- *Consumption by customer class*- This shows the annual amount of water used for an entire calendar year, broken down by customer class (Single Family, Multi Family, Commercial, Irrigation, etc)
- *Provision for New Single Family Account Use*– For selected agencies, and upon their specific request, a new category was created to model water use of new single family homes. This value is held constant in the baseline projection and not subject to plumbing codes. All new homes include the plumbing code change in the State of California that requires HETs in 2014. The new homes will also be affected by Cal Green building code after July 1, 2011 and required to install efficient fixtures for the toilets, low flow shower heads and faucets. The effects from Cal Green were run as a conservation measure as they were not in effect at the time of this analysis.
- *Unaccounted for water (UFW) also known as Non Revenue Water* – This is the sum of all water input to system that is not billed (metered and unmetered) water consumption, including

apparent (metering accuracy) and real losses. The values were calculated by taking the difference between the amount of water produced and the amount of water that was sold. Data provided by the water contractor was used, if provided, unless UFW was less than 7 percent, in which case 7 percent was used.

- *Water Produced*– This is the total amount of potable water produced. The water can come from multiple sources including amount purchased from SCWA, purchased from other agencies, local surface water, or obtained from groundwater. This does not include recycled water.
- *Peak day factor* – The ratio of water produced on the maximum day of the year to that produced on the average day.

(b) Demographic Data

- *Census 2000* – The 2000 Census data was used as a general reference when determining population and household sizes for each individual city (and/or unincorporated area) serviced by the water agencies.
- *2005 City of Cotati Service Area Population*- The 2005 total population for the City of Cotati was taken directly from the 2005 selected population source discussed earlier in this report.
- The future population projections were set to be a Single family / mutil family split of 50% / 50% as requested by the City of Cotati. The current 2005 population is currently 77.5% Single family and 22.5% multi family. The split was modified to reflect General Plan emphasis on mutli family for new development.
- *Single and multi family dwelling units*- The 2005 single family dwelling units is equal to the number of single family accounts for 2005. The 2005 multi family dwelling unit estimate was calculated by applying a growth factor to the 2000 data as noted on the water use data sheet in Figure 5.
- *Procedure for service areas not contiguous with city boundaries* – When a service area serves outside a city boundary, estimates were generated either from census tract data when available for the unincorporated areas, Department of Finance data, ABAG Projections, DWR reported data, General Plan or by the local water district if known. If none of the six sources were available, then the modeling team worked with the local water district to make reasonable estimates.
- *Employment data*– The employment figures were obtained from the selected source as discussed earlier in this report.

In summary, the key features of this sheet include the existing 2005 level of water use, 2005 baseline accounts in each customer category, and 2005 baseline forecasts for population and employment.

Figure 5
Water Use Data Input Sheet

City of Cotati Water Service Area[1]

DSS Input Sheet

November 12, 2010

Water Demand Factors Average Use and Indoor Percentages by Billing Category for DSS Model[2]

	Single family		Multifamily		Commercial		Irrigation	
Year	Average, gpd/a	Indoor	Average, gpd/a	Indoor	Average, gpd/a	Indoor	Average, gpd/a	Indoor
2006,2007	244.2	63%	1187.9	76%	708.8	74%	791.6	0%
							Commercial Irrigation	

City and Irrigation		Apt Irrigation	
Average, gpd/a	Indoor	Average, gpd/a	Indoor
723.5	0%	890	0%
City Buildings and Parks			

Data for DSS Model - - Start Year: 2005

Category	Number of Accounts in Start Year[3]	Water Use in Base Year gpd/a[2]	Water Use, MGD	Use Profile Percent	Water Use gcd	Indoor Water Use gcd
Single family	2,035	244.2	0.497	57.08%	86.4	54.3
Multifamily	97	1,187.9	0.115	13.24%	69.9	53.4
Commercial	161	708.8	0.114	13.11%		
Irrigation	127	791.6	0.101	11.55%		
City and Irrigation	42	724	0.030	3.49%		
Apt Irrigation	15	890	0.013	1.53%		
Total Billed	2,420	4,546	0.871	100.00%		
Total Water Produced Non-Weather Normalized[4] =			0.994	MGD		
Start Year Unaccounted For Water (UFW)[5] =			12.4%	Percent		
Projected UFW for DSS Model =			**10.9%**	Percent	7% if actual is < 7%, otherwise = agreed upon by agency for 30 year forecast	
Water Produced for use in DSS Model for 2005			**0.977**	MGD	Add UFW % to Total Billed Water Use	
					Water Produced / Billed /(1- Projected UFW for DSS	0.977
Peaking Factor			NA	Provided by Agency or Water Master Plan (or NA)		
Peaking Factor for DSS Model=			**2.4**	Provided by Agency		

- *Blue cells are entered by modeler*
- *Yellow cells are input to DSS Model*

NOTES

1. - Communities served (includes all or portions of) Cotati and surrounding rural areas

2 - Average gpd/a is based on a 12-month moving average through December 2009. Indoor use is based on average of 2 lowest consecutive months in the winter if meters read bimonthly, or single lowest month if meters read monthly.

3 - Number of accounts is from data provided by water agency for this project (see worksheet with account data in this file)

4 - Total water produced for 2005 was provided by City of Cotati

5 - Unaccounted for Water (UFW) is the percent difference between the total water purchased and the total billed water use. If the UFW was less than 7%, then 7% was used for planning purposes.

6 - For reference see additional population estimates provided in population and employment estimates corresponding to service area table.

7 - Initial estimate based on census data for renter occupied units. For reference see table below that has 2000 census data for corresponding water service area city or cities

8 - Group Quarters Population includes Institutionalized and non-Institutionalized and assumes their water use is in the

Definitions / Abbreviations

ABAG	Association of Bay Area Governments	HHS	household size
DOF	Department of Finance	NA	not available
DSS	Decision Support System Model	MF	multi family
du	dwelling unit	MGD	million gallons per day
FY	Fiscal Year	No.	number
gcd	gallons per capita / per day	Pop	population
gpd/a	gallons per day / per account	Res	residential
gpd	gallons per day	SF	single family
		UFW	unaccounted for water

Data Prepared:	May 1, 2005	By: M. Maddaus
Revised:	November 12, 2010	By: C. Matyas

Water Use Data Input Sheet (Page 2)

City of Cotati Water Service Area[1]

Reconcile agency account billing data and census data

Total Dwelling Units in Census 2000 for City of Cotati (city boundaries are equivalent to service area boundaries)

Single family		2000 Units	No. Buildings	Service Area Billing Accounts - Year 2000 [3]	Difference between billing and census data	Data Sources / Notes
1-detached		1,497	1,497			
1-attached		366	366			
Subtotal		1,863	1,863	1,895	32	*When there is a difference in acccounts and units, some of the attached units classified by City as Multifamily*
Multi family						
2-units		75	38			
3-4 units		215	61			
5 to 9 units		100	14			
10-19 units		105	7			
20 or more units		68	1			*Meter for assumed 50 units per building*
mobile homes		119	2			*home parks,*
Subtotal w/o mobile homes		682	124	36	-88	
	MF Average =	5.5	units/building	19.0	units/account	Typical value of DUs/account
	Total SF + MF units =	2,545				

2000 Group Quarters Data			2000 Census Data		1998 City of Cotati General Plan	
Institutionalized	0	Average household size	2.55		Year	Population
Non-Institutionalized	18	Average household size of a single family unit	2.83		1990	5700
Total	18	Average household size of a multifamily unit	1.91		1996	6501
		Homeowner vacancy rate (percent)	0.50		2000	7033
		Rental vacancy rate (percent)	2.30		2005	7565
					2010	8097

Population and Household Size in Census 2000 for Cotati

		Cotati Service Area Service Area 2000	Estimated Population 2005			Data Sources / Notes	
						Estimated growth from 2000 to 2005 (Cotati Water Supply Assesment):	*5.11%*
Total Population from Census data[6] =		6,471	7418	*Based on Cotati Water Supply Assessment page 3-3 table 3-1*		*Estimated employment growth from 2000 to 2005 (ABAG 2009 Employment Projections):*	*0.39%*
Subtract Group Quarters Population =		18	19			*Water use for the institutionalized population is accounted for in nonresidential billing categories*	
Residential Population =		6,453	7,399			*Residential population shown corresponds to the city or cities represented by Census data*	
Avg. Residential HHS [7] =		2.54					
MF Pop @ MF HHS[7] =	2.30	1,569	1,649	1,649	22.2%	*Percent of Population that is MF*	
SF Pop =		4,884	5,750	5,750	77.5%	*Percent of Population that is SF*	
SF HHS [7] =		2.62	2.83	19	0.3%	*Percent of Population in Group Quarters*	
			Total	7,418	100.0%	*Total Service Area Population used in DSS Model*	

Estimate Service Area Dwelling Units for 2005

SF Res	2,035	*Equals No. of Single Family accounts for 2005*
MF Res	717	*Equals No. Dwelling Units plus growth in accounts*

Note: future population split for SF / MF are 50% / 50% as requested by Damien O'Bid at the City of Cotati. The split was modified to reflect General Plan emphasis on mutli family for new development.

4.3 Key Assumptions for the DSS Model

Table 3 shows the key assumptions used in the model. The assumptions having the most dramatic effect on future demands are the natural replacement rate of fixtures, how residential or commercial future use is projected, and finally the percent of estimated water losses.

Table 3
List of Baseline Demand Projection Assumptions for DSS Model

City of Cotati List of Baseline Demand Projection Assumptions for DSS Model	
Parameter	**Model Input Value, Assumptions, and Key References**
Model Start Year	2005
Water Demand Factor Year(s)	Average of Years: 2006,2007
Peak Day Factor	2.4
Unaccounted for Water in the Start Year	10.9% based on Average of Years 2005-2007 data
Population Projection Source	Cotati Water Supply Assessment page 3-3 table 3-1
Employment Projection Source	ABAG 2009 Jurisdictional data
Number of Water Accounts for Start Year	2477
Avoided Cost of Water $/AF (includes escalated SCWA cost + $27.7 / AF for pumping cost)	$827.11
Distribution of Water Use Among Categories	Single Family: 57.1% Multifamily: 13.2% Commercial: 13.1% Apt Irrigation: 1.5% Irrigation: 11.5% City and Irrigation: 3.5%
Indoor Water Use by Category	Single Family: 62.8% Multifamily: 76.4% Commercial: 73.8% Apt Irrigation: 0% Irrigation: 0% City and Irrigation: 0%
Residential End Uses	AWWARF Report “Residential End Uses of Water” 1999
Non-Residential End Uses, %	AWWARF Report Commercial End Uses of Water” 1999
Efficient Residential Fixture Current Installation Rates	U.S. Census, Housing age by type of dwelling plus natural replacement plus rebate program (if any). Reference "High Efficiency Plumbing Fixtures - Toilets and Urinals" Koeller & Company July 23, 2005. Reference Consortium for Efficient Energy (www.cee1.org)
Water Savings for Fixtures, gal/capita/day	AWWARF Report “Residential End Uses of Water” 1999, , CUWCC Cost and Savings Study April 28, 2005, Agency supplied data on costs and savings, professional judgement where no published data availble
Non-Residential Fixture Efficiency Current Installation Rates	U.S. Census, assume commercial establishments built at same rate as housing, plus natural replacement
Residential Frequency of Use Data, Toilets, Showers, Washers, Uses/user/day	Falls within ranges in AWWARF Report “Residential End Uses of Water” 1999
Non-Residential Frequency of Use Data, Toilets and Urinals, Uses/user/day	Estimated based using AWWARF Report “Commercial and Institutional End Uses of Water” 1999
Natural Replacement Rate of Fixtures	Residential Toilets 3% (1.28 gpf toilets), 4% (1.6 gpf and higher toilets) Commercial Toilets 3% (1.28 gpf toilets), 4% (1.6 gpf and higher toilets) Residential Showers 4% Residential Clothes washers 6.7% A 3% replacement rate corresponds to 33 year life of a new fixture. A 6.67% replacement rate corresponds to 15 year washer life based on “Bern Clothes Washer Study, Final Report, Energy Division, Oak Ridge National Laboratory, for U.S. Department of Energy, March 1998, Internet address: www.energystar.gov
Future Residential Water Use	Increases Based on Population Growth
Future Non-Residential Water Use	Increases Based on Employment Growth

4.4 Water Demand Projections With and Without the Plumbing Code

Development of the Water Demand Projections Table and Graph

Water demand projections were developed to the year 2035 using the Demand Side Management Least Cost Planning Decision Support System (DSS) model. This model incorporates information from the:

- "Water Use Data Sheet" and the "Key Assumptions"
- Questions asked of agencies
- Contractorprovided data
- 2000 Census data and 2006-08 American Community Survey 3 year estimates
- Local General Plans
- Association of Bay Area Governments Projections

Water demand projections were input for 30 years using the DSS Model. This model incorporates information from the:

- Contractor selected population and employment forecasts.
- Data provided by City of Cotati staff including historical water use, past conservation efforts, and water system facilities.

Table 4 shows the projected demands with and without plumbing codes and appliance standards. This page includes both a table and a graph. Each will be described below.

National Plumbing Code

The Federal Energy Policy Act of 1992, as amended in 2005 requires only fixtures meeting the following standards can be installed in new buildings:

- Toilet – 1.6 gal/flush maximum
- Urinals – 1.0 gal/flush maximum
- Showerhead - 2.5 gal/min at 80 psi
- Residential Faucets – 2.2 gal/min at 60 psi
- Public Restroom Faucets - 0.5 gal/min at 60 psi
- Dishwashing pre-rinse spray valves – 1.6 gal/min at 60 psi

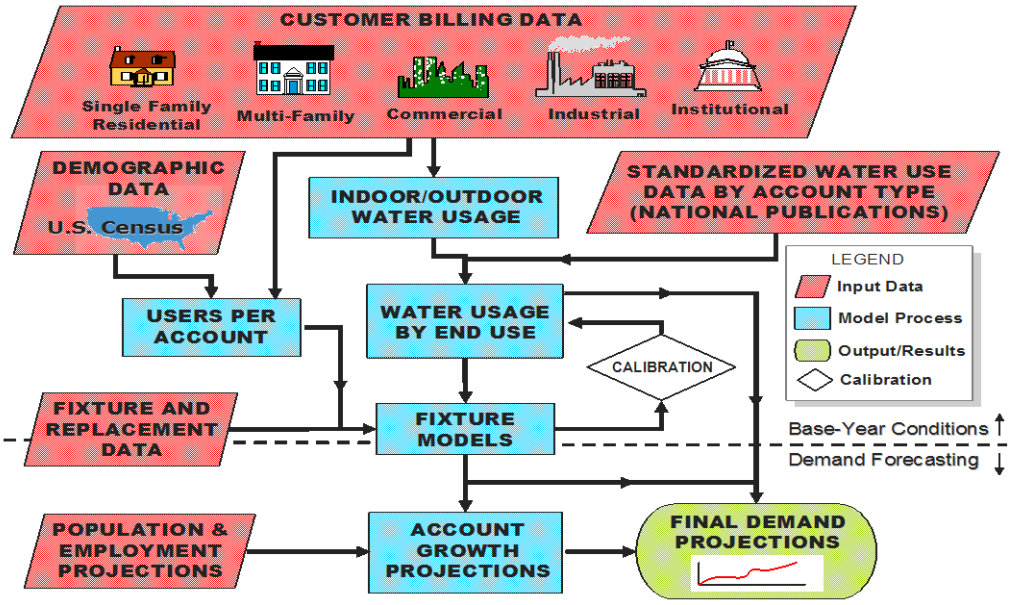
Replacement of fixtures in existing buildings is also governed by the Federal Energy Policy Act that requires only devices with the specified level of efficiency (shown above) can be sold today (2010). The net result of the plumbing code is that new buildings will have more efficient fixtures and old inefficient fixtures will slowly be replaced with new more efficient models. The national plumbing code is an important piece of legislation and must be carefully taken into consideration when analyzing the overall water efficiency of a service area.

In addition to the plumbing code the US Department of Energy regulates appliances such as residential clothes washers. Regulations to make these appliances more energy efficient has driven manufacturers to dramatically reduce the amount of water these efficient machines use. Generally horizontal axis washing machines use 30-50 percent less water than conventional models (which are still available). In the analysis for City of Cotati, the DSS Model forecasts a gradual transition to high efficiency clothes washers (using 19 gallons or less) so that by the year 2020 this will be the only type of machines purchased. In addition to the industry becoming more efficient, rebate programs for washers have been successful in encouraging customers to buy more water efficient models. Given that machines last about 15 years eventually all machines in the City of Cotati area will be of this type.

State Plumbing Code

The Plumbing Code includes the new California State Law requiring High Efficiency Toilets and High Efficiency Urinals be exclusively sold in the state by 2014. Figure 6 below describes conceptually how the above listed items are incorporated into the flow of information in the DSS Model.

Figure 6
DSS Model Overview Used to Make Potable Water Demand Projection
"With the Plumbing Code"



Graph of projected demands (Figure 7)

Figure 7 shows the potable water demand projection at five-year increments. The graph shows projections for demand with and without the plumbing code through 2035.

Table of water demand projections (Table 4)

The table of water demands projections includes:

1. The water demand projections shown in Table 4 are based on the future population and employment projections provided in Table 1 and Table 2.
2. Projections were made *with and without* the plumbing codes.
3. Projections are for potable water only. It does not include recycled water use. Recycled water use and projections are included in a separate Chapter of the UWMP.

Dry Year Demands

The demand projections reflect average weather conditions and **do not** reflect drier and hotter drought conditions.

Figure 7

Potable Water Use Projections for City of Cotati

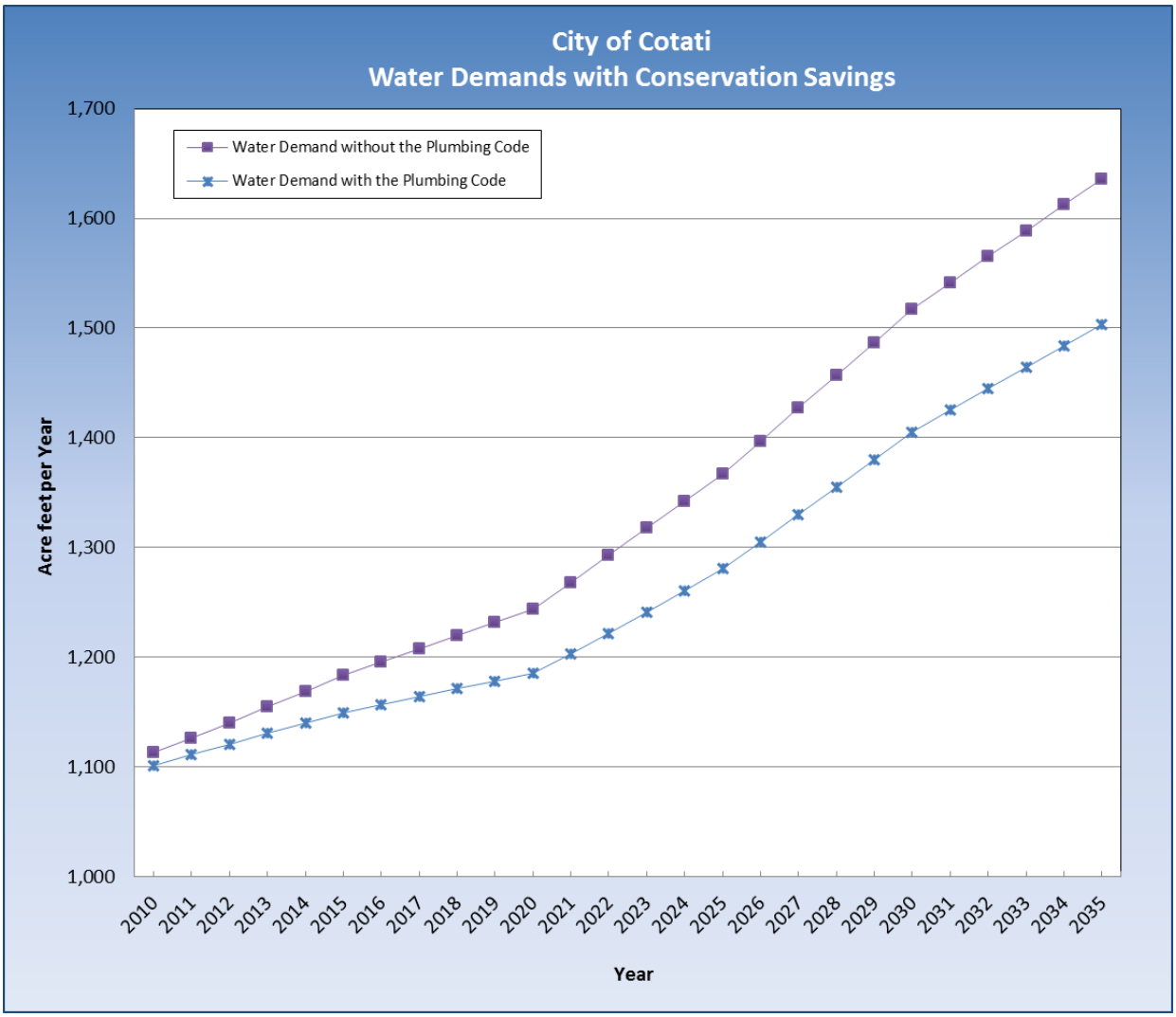


Table 4

Potable Water Use Projections for City of Cotati

City of Cotati Water Demands						
Water Demand (AFY)	**2010**	**2015**	**2020**	**2025**	**2030**	**2035**
Water Demand without the Plumbing Code	1,113	1,183	1,244	1,367	1,517	1,636
Water Demand with the Plumbing Code	1,101	1,150	1,185	1,281	1,405	1,503

*Data is not weather normalized. Total Water use is potable only. Does not include recycled water use. Recycled water use and projection are in a separate section in the UWMP.

4.5 Water Demand Projections – 2005 Urban Water Management Plan (UWMP) Format

The 2010 Urban Water Management Plan Guidance Document from the California Department of Water Resources is not planned to be released until after December 2010. Without the guidance document, the exact formatting of the tables for the 2010 UWMP are not known. Therefore, it was elected to place the demand data into the 2005 UWMP format.

Conversion of the Water Demand Projections Table and Graph to 2005 UWMP Format

The 2005 Urban Water Management Plan Guidance Document from the California Department of Water Resources (Ca DWR) requests that future demand information be in a specific format. Provided below are the five tables relating to future average day demands they requested. The demand projection shown is the "with Plumbing Code" demands and is otherwise the same as Table 4 and Figure 7. The demand projections in the Urban Water Management Plan appeared in the required DWR tables 2, 12, 13, 14, and 15 (2005 Plan requirement table numbers).

Urban Water Management Plan Tables for of 2005 UWMP

Table 5 below provides population projections for City of Cotati service area.

Table 5 (DWR Table 2) Population – Current and Projected

City of Cotati Current and Projected Population	
Year	**Population**
2010	7711
2015	8105
2020	8518
2025	8953
2030	9409
2035	9889

Current and Future Water Use by Customer Type

The current and projected number of connections and deliveries to the City's water distribution system, by sector are identified below on Table 6.

Table 6 (DWR Table 12) Current and Projected Water Deliveries

City of Cotati Demands and Accounts By Customer Category (Based on Demand with Plumbing Code, excluding UFW)									
Year		**Single Family**	**Multifamily**	**Commercial**	**Apt Irrigation**	**Irrigation**	**City and Irrigation**	**Agriculture**	**Total**
2010	**Number of Accounts**	2,115	101	152	16	120	44	0	2,548
	Deliveries AF/Y	572	132	120	16	106	35	0	981
2015	**# of accounts**	2,224	106	169	16	133	46	0	2,693
	Deliveries AF/Y	588	135	130	16	118	37	0	1,024
2020	**# of accounts**	2,337	111	177	17	140	48	0	2,831
	Deliveries AF/Y	603	137	135	17	124	39	0	1,056
2025	**# of accounts**	2,456	117	223	18	176	51	0	3,041
	Deliveries AF/Y	620	141	166	18	156	41	0	1,142
2030	**# of accounts**	2,581	123	282	19	223	53	0	3,282
	Deliveries AF/Y	642	145	207	19	197	43	0	1,253
2035	**# of accounts**	2,713	129	321	20	253	56	0	3,492
	Deliveries AF/Y	667	150	234	20	224	45	0	1,340

Water Sales to Other Agencies

The City of Cotati does not currently sell water to any other agency. According to City of Cotati, all "outside sales" are local businesses and residents, and not to another agency.

Table 7 (DWR Table 13) Sales to Other Agencies

City of Cotati Sales to Other Agencies	N/A	N/A	N/A	N/A	N/A	N/A
Water Distributed (AFY)	N/A	N/A	N/A	N/A	N/A	N/A

Unaccounted-for Water and Additional Water Use

For this project unaccounted for water is defined to be the difference between water produced and water sold to customers. Unaccounted-for water use normally includes unmetered water use such as for fire protection and training, system and street flushing, sewer cleaning, construction, system leaks, meter inaccuracy, and unauthorized connections. Unaccounted-for water can also result from meter inaccuracies.

Table 8 (DWR Table 14) Additional Water Uses and Losses, AF/yr

City of Cotati Unaccounted for Water in AF/Yr	2010	2015	2020	2025	2030	2035
Unaccounted-for system losses (AFY)	121	125	130	139	152	163

Total Water Use

The total present and future water use for the system is shown in the table below.

Table 9 (DWR Table 15) Total Potable Water Use, AF/yr*

City of Cotati Total Demand with Plumbing Code in AF/Yr	2010	2015	2020	2025	2030	2035
Total Demand with Plumbing Code and UFW (AFY)	1,101	1,150	1,185	1,281	1,405	1,503

*Total Water use is potable only. Does not include recycled water use. Recycled water use and projection are in another section of the UWMP.

5. COMPARISON OF INDIVIDUAL CONSERVATION MEASURES

5.1 Selecting Conservation Measures to be Evaluated (Conservation Measure Screening)

An important step in updating the water conservation program is the review and screening of new water conservation measures. In 2005, a list of 75 potential conservation measures was developed by Maddaus Water Management from known technology that included devices or programs (e.g., such as a high efficiency toilet) that would save water if installed by a water retailer, contractor, or customer. These measures are considered to be beyond the Tier One measures. A description of the potential conservation measure was developed that addressed the methods through which the device or program will be implemented, including the distribution method, or mechanism, that would be used to activate the device or program.

A screening process was undertaken to reduce the number of measures to a more manageable number and to eliminate those measures that are not as well suited to the Marin-Sonoma County area as other

potential measures. Each potential measure was screened based on four qualitative criteria (below), scored on a scale of 1 to 5, with 5 being the most acceptable, and 20 being the maximum possible number of points for all criteria. The screening was completed by local conservation professionals, in a one day meeting in July 2005, facilitated by Maddaus Water Management.

Qualitative Criteria

The rating group used the following criteria to evaluate the measures:

- **Technology/Market Maturity** – Refers to whether the technology needed to implement the conservation measure, such as an irrigation control device, is commercially available and supported by the local service industry. A measure was scored low if the technology was not commercially available or high if the technology was widely available in the service area. A device may be screened out if it is not yet commercially available in the region.
- **Service Area Match** – Refers to whether the measure or related technology is appropriate for the area's climate, building stock, or lifestyle. For example, promoting Xeriscape gardens for multi-family or commercial sites may not be appropriate where water use analysis indicates little outdoor irrigation. Thus, a measure scored low in this category if it was not well suited for the area's characteristics and could not save water. A measure scored high in this criterion if it was well suited for the area and could save water.
- **Customer Acceptance/Equity** – Refers to whether retail customers within the wholesale customer service area would be willing to implement and accept the conservation measures. For example, would retail customers attend homeowner irrigation classes and implement lessons learned from these classes? If not, then the water savings associated with this measure would not be achieved and a measure with this characteristic would score low for this criterion. This criterion also refers to retail customer equitability (i.e., one category of retail customers receives benefit while another pays the costs without receiving benefits). Retail customer acceptance may be based on:
    - Convenience
    - Economics
    - Perceived fairness
    - Aesthetics
- **Relative Effectiveness of Measure Available** – Refers to the selection of the most effective measure if alternate conservation measures address the same end use (example – irrigation for single family customers). If the measures are equally effective the most appropriate was selected (e.g., the measure that was easier or less expensive to implement).

Measures with low scores were eliminated from further consideration, while those with high scores passed into the next evaluation phase (cost-effectiveness analysis using the DSS Model). To reduce the list to a more manageable number, normally a score of 17 or more was necessary to pass. The process reduced the measures to be evaluated further down to 22 new measures in addition to the 10 Tier One measures.

Upon inspection of the overall list of new measures it became apparent that some measures could be combined and others could be separated into two categories as follows:

- Measures that were voluntary and incentive based
- Measures that were regulatory and applied to new development only

This division was used to create two lists of measures that could be evaluated separately. Tier Two targets various types of customers and offers a range of incentives to enhance participation. New Development measures were originally targeted at single family homes (including town homes and condos), as this category represents the largest category of new development with the most water savings potential.

The following table presents the measure descriptions that were originally analyzed as part of the 2005 study for "Tier 2" and "New Development" (ND) as well as the new measures that the contractors selected for this analysis. We have not modified the Tier 2 and New Development measure descriptions from their original description other than to add information for Cal Green, SB 407, and the Model Water Efficient Landscape Ordinance. The Tier 1 measures follow the definition of the CUWCC BMPs.

Cal Green (New Development Building Code): MWM added the Cal Green requirements that effect all new development in the State of California after January 1, 2011. MWM modeled water savings from the Cal Green building code by adding Multifamily and Commercial customer categories as appropriate to the following six measures: Tier 2 – 13 (Urinals), ND 1 (Rain Sensors), ND 2 (Smart Controllers), ND 3 (HETs), ND 7 (High Efficiency Faucets and Showerheads) and ND 8 (Landscape Requirements). As this is a new development law and based on discussions with contractors it was assumed actual water savings seen by contractor would begin to occur in the year 2012. The new development ordinances for each contractor are listed in Table 10.

SB 407 (Plumbing Fixture Retrofit on Resale or Remodel): MWM included the new California Law SB 407 to the measure description table and in all of the contractors' models as a new measure. In the model MWM worked carefully such that SB 407 takes into account the overlap with the plumbing code (natural replacement), Cal Green and rebate programs (such as through Tier 2-10 Toilets). SB 407 begins from the year 2017 in residential and 2019 in commercial properties. SB 407 program length continues until all the older high flush toilets have been replaced in each service area.

Tables 11, 12, 13 and 14 summarize the new measures selected for each contractor. Note that measures Tier 2-8, Tier 2-9 and Tier 2-11 were removed from this program at the request of all the contractors on August 2, 2010 for the following reasons:

- Measure Tier 2-8 was removed because new development regulations have changed significantly since this measure was analyzed in 2005 and the regulations require higher efficiency fixtures than this measure.
- Measure Tier 2-9 was removed as rebates for installing synthetic turf are incorporated into Measure Tier 2-2, Cash for Grass.
- Measure Tier 2-11 was removed because this measure is not cost-effective.

The removed measures are included in Table 13 for reference purposes only, but were not included in any of the DSS Model or any of the quantitative water saving calculations.

Table 10
New Development Ordinances

New Development Ordinances								
ND Measure	NMWD	City of Rohnert Park[1]	City of Cotati[2]	City of Santa Rosa	Town of Windsor	City of Sonoma	Valley of the Moon WD	Draft Cal Green Requirement
Applicability (Customer Classes)	All	All	All	All	All	All	All	All
ND1-Rain Sensor Retrofit	2005	No	No	2010	2010 (SF>4 lots) & >2,500 sq ft/lot	No	2010, SF>5,000 sq ft	No
ND2-Smart Irrigation Controller	2005	No	2010	2010	2010 (SF>4 lots) & >2,500 sq ft/lot	No	2010, SF>5,000 sq ft	Yes
ND3- High Efficiency Toilets	2005	No	2009	2011	No	No	No	Yes
ND4- Dishwasher New Efficient	2005	No	2009	No	No	No	No	No
ND5-Clothes Washing Machine Requirement	2000	No	2009	No	No	No	No	No
ND6-Hot Water on Demand	No	No	No	No	No	No	No	No
ND7-High Efficiency Faucets and Showerheads	2006	No	2009	2011	No	No	No	Yes
ND8-Landscape and Irrigation Requirements	2004	2010 (State ordinance)	2010	SF since 2007. All other since 1993	2011 for landscapes > 2,500 sq ft (applies to all but SF<5 lots)	2010 (adopted ordinance planned to be adopted September 1, 2010, budgets w/ 60% ET	2010 for All except SF<5,000 sq. ft. and turf<600 sq ft	Yes
Urinals	2008	No	No	2011	No	2009	No	Yes
Source	NMWD Reg 15	Use Build it Green Checklist (Mandatory)	Use Build it Green Checklist (Mandatory)	Adopting Cal Green 2010	Adopting Landscape ordinance June 2010	Use Build it Green Checklist (Mandatory)	County ordinance effective Jan 1, 2010	State Reqmt; May take effect 2012

[1]City of Rohnert Park has extensive green building ordinance requiring developers to select from a set of green building measures including some of the listed measures.

[2]City of Cotati ND-3 confirmed to start in 2009 based on July 27, 2010 with City of Cotati at the request of Damien O'Bid. Build It Green Checklist mandatory, beginning in the year 2004. The year 2009 was selected as a start date for 100% deployment of measures, as the measures can be selectively deployed providing the overall point minimum is achieved.

Table 11
Cal Green Building Code

Cal Green Building Code						
Building Class	**Component**	**Effective Date[i]**	**Indoor Fixtures Included**	**Indoor Requirement**	**Landscaping & Irrigation Requirements**	**Are the Requirements Mandatory?**
Residential	Indoor	1/1/2011	Toilets, Showers, Lavatory & Kitchen Faucets, Urinals	Achieve 20% savings overall below baseline		Yes
	Outdoor	1/1/2011			Provide weather adjusting controllers	Yes
Non Residential	Indoor	1/1/2011	Submeter leased spaces	Only if building >50,000 sq. ft. & if leased space use >100 gpd		Yes
			Toilets, Showers, Lavatory & Kitchen Faucets, Wash Fountains, Metering Faucets, Urinals	Achieve 20% savings overall below baseline		Yes
	Outdoor	1/1/2011			Provide water budget	> 1,000 sq ft. landscaped area
					Separate meter	As per Local or DWR ordinance
					Prescriptive landscaping requirements	> 1,000 sq ft. landscaped area
					Weather adjusting irrigation controller	Yes

[i] Effective date is 7/1/2011 for toilets

Table 12
Tier One Conservation Measures Evaluated in the DSS Model

Measure Number	Original CA BMP Number	Target Customer Category	Measure	Description
1	1	RSF, RMF	Residential Water Surveys - Indoor	This is the indoor component of indoor and outdoor water surveys for existing single-family and multi family residential customers. Normally those with high water use are targeted and provided customized report to homeowner.
2	1	RSF, RMF	Residential Water Surveys - Outdoor	This is the outdoor component of indoor and outdoor water surveys for existing single-family and multi family residential customers. Normally those with high water use are targeted and provided customized report to homeowner.
3	2	RSF, RMF	Residential Retrofit	Provide owners of pre-1992 homes with retrofit kits that contain easy-to-install low flow showerheads, faucet aerators, and toilet tank retrofit devices, until saturation reaches 75%.
4	5a	IRR	Water Budgets	90% of all irrigators of landscapes with separate irrigation accounts would receive a monthly or bi-monthly irrigation water use budget.
5	5b	IND	Large Landscape Conservation Audits	All public and private irrigators of landscapes larger than one acre would be eligible for free landscape water audits upon request.
6	6	RSF	Clothes Washer Rebate	Homeowners would be eligible to receive a rebate on a new water efficient clothes washer.
7	7	RSF, NRSF	Public Information Program	Public education would be used to raise awareness of other conservation measures available to customers. Programs could include poster contests, speakers to community groups, radio and television time, and printed educational material such as bill inserts, etc.
8	9	COM	Commercial Water Audits	High water use accounts would be offered a free water audit that would evaluate ways for the business to save water and money.
9	14	RSF	Single Family Residential ULF Toilet Rebate	Homeowners would be eligible to receive a rebate to replace an existing high volume toilet with a new water efficient toilet.
10	14	RMF	Multi family Residential ULF Toilet Rebate	Homeowners would be eligible to receive a rebate to replace an existing high volume toilet with a new water efficient toilet.

Notes:

RSF = Residential Single Family RMF = Residential Multi Family NRSF = New Residential Single Family

COM = Business INS = Institutional IND = Industrial

Table 13
Tier Two and New Development Conservation Measures Evaluated in the DSS Model

Measure Number	Name of Measure	Target Customer Category	Description
Tier 2-1	Rain-sensor (shut off device) retrofit on irrigation controllers	Existing Customers SF	Agency pays for the rain sensor, homeowner pays for the optional installation ($35).
Tier 2-2	Cash for Grass (turf removal program)	Existing Customers SF, MF, CII	Provide a rebate for customers who remove irrigated turf grass and replace it with low water using plants. The rebate would require that an appropriate irrigation system be installed for the replacement landscaping. Limited to $500 rebate at $1.00 per square foot.
Tier 2-3	Financial Incentives for Being Below Water Budget	All Dedicated Irrigation Meter customers	For dedicated irrigation customers, link a landscape water budget to a retail water agency's rate schedule so that the dedicated irrigation meter customer pays less when their water use is at or under their water budget.
Tier 2-4	Financial Rebates for Irrigation Meters	Existing CII Customers with mixed water use (indoor and outdoor)	Provide financial incentives/rebates for selected permits and equipment to convert mixed use meters to a separate dedicated irrigation meter. Model implementation program after City of Santa Rosa's Service Split program. Utility will provide a water budget for the new irrigation meter.
Tier 2-5	Smart Irrigation Controller Rebates	Existing Customers SF, MF, CII, IRR	Provide an up to $450 rebate for the purchase of a SMART irrigation controller and associated signal fees (up to $150). Assume one controller for RSF and two for others. Minimum participant requirements: at least 500 sq ft of well maintained turf irrigated with an automatic irrigation control system.
Tier 2-6	Financial Incentives/ Rebates for Irrigation Upgrades	Existing Customers MF, CII, IRR, and SF for some contractors if requested as a new measure	For MF & CII customers with landscape provide rebates for selected types of irrigation equipment upgrade including rain sensors, rain harvesting, and grey water. Each contractor can include any equipment desired and allow the customers to select the items they prefer up to the maximum rebate value per customer. Water savings assumes a mixture of many different irrigation technologies. Model program after water agencies such as EBMUD or Contra Costa Water District or Santa Rosa.
Tier 2-7	Hotel retrofit (w/financial assistance) - CII Existing	Existing Customers: CII	Following a free water audit, offer the hotel a rebate for equipment identified that would save water. Provide a rebate schedule for certain efficient equipment such as air-cooled ice machines, steamers, washers, cooling towers, and spray rinse valves.
Tier 2-8 **MEASURE REMOVED FROM 2010 ANALYSIS**	Offer new accounts reduced connection fees for installing efficient process equipment for selected businesses (restaurants, laundry mat, food/groceries and hospital)	New Customers: CII	Offer reduced water and sewer connection fees to new facilities to install water efficient equipment in new facilities that goes above and beyond the building code requirements. Model program after Santa Rosa's BAT program.

Measure Number	Name of Measure	Target Customer Category	Description
Tier 2-9 **MEASURE REMOVED FROM 2010 ANALYSIS**	Synthetic Turf Rebate	Existing Customers: SF (North Marin only) , IRR	Provide a rebate for replacing existing turf with synthetic turf. Market program to all irrigation customers and single family for North Marin only.
Tier 2-10	High Efficiency Toilet (HET)	Existing Customers: SF & MF	Provide a rebate or voucher for the installation of a high efficiency toilet (HET). HET are defined as any toilet to flush 20% less than an ULFT and include dual flush technology. Rebate amounts would reflect the incremental purchase cost.
Tier 2-11 **MEASURE REMOVED FROM 2010 ANALYSIS**	Dishwasher New Efficient	Existing Customers: SF	Provide a rebate to encourage homeowners to replace old inefficient dishwashers with new efficient dishwashers (meeting certain water efficiency standards, such as gallons/load).
Tier 2-12	CII Rebates - replace inefficient water using equipment	Existing Customers: CII	Provide a rebate for a standard list of water efficient equipment. Included would be x-ray machines, icemakers, air-cooled ice machines, steamers, washers, spray valves, efficient dishwashers, replace once through cooling, add conductivity meters on cooling towers, etc.
Tier 2-13	0.5 gal/flush urinals in new buildings	New Customers: CII	Require that new buildings be fitted with 0.5 gpf or less urinals rather than the current standard of 1.0-gal/flush models.
ND1	Rain-sensor shut off device on irrigation controllers	New Customers: SF, MF and CII depending upon local ordinances and contractor request of new measures	Require-sensor or rain shut off devices with all new automatic irrigation system installations on new homes.
ND2	Smart Irrigation Controller	New Customers: SF, MF and CII depending upon local ordinances and contractor request of new measures	Require developers to provide the latest state of the art SMART irrigation controllers. These SMART controllers have on-site temperature sensors or rely on a signal from a central weather station that modifies irrigation times at least weekly.
ND3	High Efficiency Toilet (HET)	New Customers: SF, MF and CII depending upon local ordinances and contractor request of new measures	Require new single family and multifamily residents to install a high efficiency toilet (HET). HET are defined as any toilet to flush 20% less than an ULFT and include dual flush technology.
ND4	Dishwasher New Efficient	New Customers: SF, MF and CII depending upon local ordinances and contractor request of new measures	Require new single-family residents to install an efficient dishwasher (meeting certain water efficiency standards, such as gallons/load).
ND5	Clothes washing machines requirement for new residential	New Customers: SF, MF and CII depending upon local ordinances and contractor request of new measures	Building departments would be responsible to ensure that an efficient washer was installed before new home occupancy.

Measure Number	Name of Measure	Target Customer Category	Description
ND6	Hot Water on Demand	New Customers: SF, MF and CII depending upon local ordinances and contractor request of new measures	Require developers to equip new homes with a hot water on demand system or tankless hot water heaters, such as those made by Metland Systems and others. These systems use a pump placed under the sink to recycle water sitting in the hot water pipes to the water heater.
ND7	High efficiency faucets and showerheads	New Customers: SF, MF and CII depending upon local ordinances and contractor request of new measures	Require developers to install Lavatory faucets that flow at no more than 1.5 gpm, kitchen faucets at 2.2 gpm, showerheads at 2.0 gpm
ND8	Landscape and irrigation requirements	New Customers: SF, MF and CII depending upon local ordinances and contractor request of new measures	Enforce a regulation that specifies that homes be landscaped according to Xeriscape principals and the Model Water Efficient Landscape Ordinance, with appropriate irrigation systems. (Combines with Smart Controller listed above). Goal is overall 25% reduction in irrigation water use.
New Measure	SB 407	Existing: SF, MF and CII	Measure will start in the year 2017 for SF accounts and 2019 for MF and CII accounts to coincide with the California State Law SB 407. The law includes working with the real estate industry to require a certificate of compliance be submitted to the City stating that, when a property is sold, information on whether or not indoor water fixtures are efficient was disclosed to the buyer.
Potential New Measure Selected by One or More Contractors	Rainwater harvesting	New Customers SF; Existing SF, MF	Provide a rebate ($100 RSF and $200 RMF) to assist a certain percentage of single family homeowners per year with installation of rain barrels or cisterns.
Potential New Measure Selected by One or More Contractors	Grey Water System Rebate	New Customers SF; Existing SF	Provide a rebate (up to $500) to assist a certain percentage of single family homeowners per year to install gray water systems. Parts cost approx $200, installation is approx $400-$500
Potential New Measure Selected by One or More Contractors	Conservation Pricing	Existing Customers: SF, MF, CII	Change Rate Structure to an inclining block rate and increase prices significantly periodically to maintain savings, such as every ten years.
Potential New Measure Selected by One or More Contractors	Submetering and Consumption Billing of Apartments and Mobile Homes	New Customers: MF	Require installation of submeters on all new MF and mobile home accounts unless the building has a central, circulating hot water system (which precludes a meter on all water going to each unit).

RSF = Residential Single Family RMF = Residential Multi Family NRSF = New Residential Single Family

COM = Business INS = Institutional IND = Industrial

Table 14
Conservation Measures Evaluated in the DSS Model

New Conservation Measures for Analysis (New for the 2010 analysis)							
Measure	City of Cotati	North Marin Water District	City of Rohnert Park	City of Santa Rosa	City of Sonoma	Valley of the Moon Water District	Town of Windsor
Rainwater Harvesting Rebate				✓			
Grey Water System Rebate				✓		✓	
Tiered Water Rates (Conservation Pricing)	✓				✓		
Submetering and Consumption Billing of Apartments and Mobile Homes - New and Existing			✓				
Add CII to New Develoment Requirements	✓	✓					✓
SB407 - Retrofit of High Efficiency Fixtures	✓	✓	✓	✓	✓	✓	✓
Add SF Residential to Irrigation System Upgrades (T2-6)		✓			✓	✓	✓

5.2 Perspectives on Benefits and Costs

The determination of the economic feasibility of water conservation programs depends on comparing the costs of the programs to the benefits provided. The analysis was performed using the DSS Model. The DSS Model calculates savings at the end-use level; for example, the model determines the amount of water a toilet rebate program saves in daily toilet use for each single family account.

Present value analysis using constant 2010 dollars and a real discount rate of 3% is used to discount costs and benefits to the base year. From this analysis, benefit-cost ratios of each measure are computed. When measures are put together in programs, the model is set up to avoid double counting savings from multiple measures that act on the same end use of water. For example, multiple measures in a program may target toilet replacements. The model includes assumptions to apportion water savings between multiple measures.

Economic analysis can be performed from several different perspectives, based on which party is affected. For planning water conservation programs for utilities, the perspectives most commonly used for benefit-cost analyses include the utility and the community. The "utility" benefit-cost analysis is based on the benefits and costs to the water provider. The "community" benefit-cost analysis includes the utility benefit and costs together with account owner/customer benefits and costs. These include customer energy and other capital or operating cost benefits plus costs of implementing the measure, beyond what the utility pays.

The utility perspective offers two advantages for this analysis. First, it considers only the program costs that will be directly borne by the utility. This enables the utility to fairly compare potential investments for saving and supplying water. Second, because revenue shifts are treated as transfer payments, the analysis is not complicated with uncertainties associated with long-term rate projections and retail rate design assumptions. Because it is the water provider's role in developing a conservation plan that is paramount in this study, the utility perspective was primarily used to evaluate elements of the plan.

The community perspective is defined to include the utility and the customer costs and benefits. Costs incurred by customers striving to save water while participating in conservation programs are considered, as well as the benefits received in terms of reduced energy bills (from water heating costs) and wastewater savings, among others. Other factors external to the utility, such as environmental effects and climate change, are not included in the benefit-cost analysis. Because these external factors are often difficult to quantify and are not necessarily under the control of the utility, they are therefore frequently excluded from economic analyses, including this one.

5.3 Present Value Parameters

The time value of money is explicitly considered. The value of all future costs and benefits is discounted to 2005 (the model start year) at the real interest rate of 3.0%. The DSS Model calculates this real interest rate, adjusting the current nominal interest rate (assumed to be approximately 6.1%) by the assumed rate of inflation (3.0%). Cash flows discounted in this manner are herein referred to as "Present Value" sums.

5.4 Assumptions about Measure Costs

Costs were determined for each of the measures based on industry knowledge, past experience and data provided by the City of Cotati. Costs may include incentive costs, usually determined on a per-participant basis; fixed costs, such as marketing; variable costs, such as the costs to staff the measures and to obtain and maintain equipment; and a one-time set-up cost. The set-up cost is for measure design by staff or consultants, any required pilot testing, and preparation of materials that will be used in marketing the measure. Measure costs were estimated for 30 years, (each year between 2005 and 2035). Costs were spread over the time period depending on the length of the implementation period for the measure and estimated voluntary customer participation levels.

Lost revenue due to reduced water sales is not included as a cost because the conservation measures evaluated herein generally take effect over a span of time that is sufficient to enable timely rate adjustments, if necessary, to meet fixed cost obligations.

5.5 Assumptions about Measure Savings

Data necessary to forecast water savings of measures include specific data on water use, demographics, market penetration, and unit water savings. Savings normally develop at a measured and predetermined pace, reaching full maturity after full market penetration is achieved. This may occur three to ten years after the start of implementation, depending upon the implementation schedule.

5.6 Assumptions about Avoided Costs

The most expensive source of water for almost all of the contractors, and in some cases the only source of water is the SCWA Russian River Supply. The price of the water to the contractors is set by SCWA every year and varies by contractor location, depending upon which aqueduct they draw from. Since 1990 the annual price of water has increased significantly. The annual rate of increase for 1989/1990 to 2010/11 has varied from 4.5 to 5.1% per year depending upon the aqueduct.
Since 1990 the annual rate of inflation has increased 2.64% per year in the San Francisco Bay Area, as measured by the Consumer Price Index (CPI). Based on this data the price of SCWA water has increased faster than the CPI.

Therefore in evaluating the benefit cost ratio of conservation measures and programs it is appropriate to consider the net increase in benefits (i.e., the net increase in the avoided cost of water). Other costs, such as the cost of conservation will increase presumably at the CPI rate. Also the cost of conservation programs will be paid for with inflated dollars.

For this evaluation the avoided costs were escalated from the 2010/11 value to a projected 2025/26 value (15 years). The cost escalated was the 2010/11 current price plus a distribution cost of $27.70 per acre-foot taken from pumping costs documented by North Marin Water District, which was the only contractor that had pumping costs readily available, and used for all contractors.

The net increase and the avoided costs used in this evaluation are listed below:

- Santa Rosa aqueduct contractors - 1.86% per year escalation or $ 832 per acre-foot
- Petaluma aqueduct contractors - 1.81% per year escalation or $ 827 per acre-foot
- Sonoma aqueduct contractors - 2.43% per year escalation or $1,006 per acre-foot
- Windsor was escalated at the Santa Rosa rate to $ 991 per acre-foot

This has the effect of raising the benefit-cost ratios in our evaluation by the amount that is roughly the percentage difference in the future vs. the current price of SCWA water. In our opinion this escalation represents a more realistic comparison of benefits and costs of conservation.

5.7 Measure Assumptions including Unit Costs, Water Savings, and Market Penetrations

Appendix A includes assumptions in the DSS Model for each of the following variables for all measures modeled:

- *Targeted Water User Group; End Use* – Water user group (e.g., single-family residential) and end use (e.g., indoor or outdoor water use).
- *Utility Unit Cost (for contractor)* – Cost of rebates, incentives, and contractors hired (by the utility) to implement measures.
- *Retail Customer Unit Cost* – Cost for implementing measures that is paid by retail customers (i.e., the remainder of a measure's cost that is not covered by a utility rebate or incentive).
- *Utility Administration and Marketing Cost* – The cost to the utility administering the measure, including consultant contract administration, marketing, and participant tracking. The mark-up is sufficient (in total) to cover local agency conservation staff time and general expenses and overhead.

The unit costs vary according to the type of account and implementation method being addressed. For example, a measure might cost a different amount for a residential single family account, than a residential multi family account, and for a rebate versus a direct installation implementation method. Typically water utilities have found that there are increased costs associated with achieving higher market saturation, such as more surveys per year. Appendix A shows the unit costs used in the study. The model calculates the annual costs based on the number of participants each year. The general formulas for calculating annual costs are:

Annual Utility Cost = Annual market saturation x total accounts in category x utility unit cost per account x (1+administration and marketing markup)

Annual Customer Cost = Annual number of participants x retail customer unit cost

Annual Community Cost = Annual utility cost + annual customer cost

5.8 Comparison of Individual Measures

Table 15 presents how much water the measures would save over 30 years, how much they would cost, and what cost of water saved is *if the measures were run on a stand-alone basis (i.e. without interaction or overlap from other measures that might address the same end use(s).* Only the net or highest water savings for overlapping conservation measures was included in each program.

Economic indicators are defined below:

- *Utility costs:* those costs that the utility would spend include measure set-up, annual administration, and payment of rebates or purchase of devices or services as specified in the measure design.
- *Customer costs:* those costs customers would spend to participate in City of Cotati programs and maintaining its effectiveness over the life of the measure.
- *Community costs:* Community costs include utility and customer costs to implement measures.

The column headings in Table 15 are defined as follows:

- *Year 2035 Water Savings (AF/Yr)* = water savings in 2035 (AF/Yr) where AF/Yr = acre-feet per year.
- *Present Value of Water Utility Costs* = 30 year present value of the time stream of annual costs.
- *Utility Benefit-Cost ratio* = NPV of utility costs/NPV of utility benefits over 30 years.
- *Community Benefit-Cost ratio* = (NPV of Utility Benefits plus NPV of customer energy savings)/NPV of utility plus NPV of customer costs).
- *Utility Cost of Savings per Unit Volume ($/AF, by cost category)* = NPV of Category Costs divided by 30-year volume of water saved.
- *Total Utility Cost for Five Years 2011-2015* = Total cost in dollars to run the program for the years 2011 to 2015 (five years). This is a five year cost often useful for short term financial budgeting purposes.

Table 15
Conservation Measure Cost and Savings

City of Cotati Conservation Measure Cost and Savings Measure Name	Year 2035 Water Savings (AFY)	Present Value of Water Utility Costs	Utility Benefit Cost Ratio	Community Benefit Cost Ratio	Utility Cost of Savings per Unit Volume ($/AF)	Total Utility Cost for Five Years 2011-2015
CUWCC #1a - Residential Water Surveys - Interior	1.68	$32,821	0.79	1.82	$686	$ 3,552
CUWCC #1b - Residential Water Surveys - Outdoor	2.36	$32,287	1.02	0.92	$523	$ 3,420
CUWCC #5a - Large Landscape Water Budgets	26.99	$131,743	2.13	2.13	$239	$ 23,920
CUWCC #6 - Washer Rebates	1.70	$19,676	1.78	2.71	$310	$ 15,405
CUWCC #7 - Residential Public Education	6.29	$73,797	1.28	2.67	$421	$ 16,276
CUWCC #9 - Commercial Water Audits	16.47	$106,310	2.49	2.76	$216	$ 31,565
CUWCC #14a - RSF Toilet Replacement	0.00	$26,190	2.24	0.90	$248	$ -
CUWCC #14b - RMF Toilet Replacement	0.00	$2,220	3.66	1.46	$149	$ -
Tier 2 - 1 Rain Sensor Retrofit	1.91	$9,322	1.81	0.75	$257	$ 2,148
Tier 2 - 2 Cash for Grass	0.64	$7,511	0.99	0.55	$492	$ 6,129
Tier 2 - 3 Financial Incentives for Being Below Water Budget	28.28	$233,814	1.07	0.15	$428	$ -
Tier 2 - 5a Smart Irrigation Controller Rebates - RSF	1.49	$61,398	0.21	0.18	$2,180	$ 12,565
Tier 2 - 5b Smart Irrigation Controller Rebates - RMF, CII, IRR	6.21	$80,531	0.73	0.46	$635	$ 20,758
Tier 2 - 6 Financial Incentives/Rebates for Irrigation Upgrades	2.42	$14,228	1.45	0.81	$313	$ 2,843
Tier 2 - 10 High Efficiency Toilets	1.22	$76,641	0.21	0.12	$2,320	$ 45,630
Tier 2 - 12 CII Rebates - Replace Inefficient Water Using Equipment	0.43	$6,866	0.53	0.61	$852	$ 1,361
Tier 2 -13 New Commercial Urinals	0.05	$495	1.74	0.19	$295	$ 406
Tier 2 - ND1 Rain Sensor Retrofit	7.20	$4,609	7.62	1.52	$56	$ 297
Tier 2 - ND2 Smart Irrigation Controller	12.53	$5,048	12.93	0.35	$34	$ 816
Tier 2 - ND3 High Efficiency Toilets	0.77	$2,447	4.70	0.21	$108	$ 2,282
Tier 2 - ND4 Dishwasher New Efficient	0.94	$5,245	1.05	0.30	$420	$ 1,037
Tier 2 - ND5 Clothes Washing Machine Requirement	9.43	$5,245	12.34	1.53	$37	$ 1,037
Tier 2 - ND6 Hot Water on Demand	12.11	$4,857	12.94	0.74	$33	$ 595
Tier 2 - ND7 High Efficiency Faucets and Showerheads	10.59	$6,767	8.48	6.14	$52	$ 1,177
Tier 2 - ND8 Landscape and Irrigation Requirements	8.35	$6,561	6.63	0.03	$65	$ 945
Tier 2 - SB 407 Requirements	1.47	$441	21.90	0.49	$19	$ -
Conservation Pricing Measure	74.71	$113,423	3.94	5.31	$114	$ 1,361

6. RESULTS OF CONSERVATION PROGRAM EVALUATION

6.1 Selection of Measures for Programs

Table 16 provides a summary of which measures are included in each of the six draft alternative programs. The six packages are designed to illustrate a range of various measure combinations and resulting water savings.

These programs are not intended to be rigid programs but rather to demonstrate the range in savings that could be generated if selected measures were run together. In this step we account for a percent overlap in water savings (and benefits) and estimate combined savings and benefits from programs or packages of measures.

A description of each program evaluated follows. For most contractors Tier Two measures are modeled to commence in 2011. The only reason the measure would not start in 2011 is if an agency had submitted data showing activity in one of the Tier 2 programs from 2005 to 2009. Most agencies have shown significant activity on the Tier One measures since the model start year of 2005.

Program – Existing

Savings for the "Existing Program" include the measures that have been run during the time period of 2005 and 2009 as submitted by each individual contractor. For the City of Cotati, the following measures were included:

Existing Program Conservation Measures:

Existing Program Conservation Measures:

- CUWCC #1 - Residential Water Surveys - Interior
- CUWCC #1 - Residential Water Surveys - Outdoor
- CUWCC #2 - Plumbing Retrofit Kits
- CUWCC #3 – System Water Loss Reduction
- CUWCC #5a - Large Landscape Water Budgets
- CUWCC #5b - Large Landscape Audits
- CUWCC #6 - Washer Rebates
- CUWCC #7 - Residential Public Education
- CUWCC #9 - Commercial Water Audits
- CUWCC #14 - RSF Toilet Replacement
- Tier 2 – 1 Rain Sensor Retrofit
- Tier 2 - ND3 High Efficiency Toilets
- Tier 2 - ND4 Dishwasher New Efficient
- Tier 2 - ND5 Clothes Washing Machine Requirement
- Tier 2 - ND7 High Efficiency Faucets and Showerheads
- Tier 2 - ND8 Landscape and Irrigation Requirements

Program – Existing + New Measures

Savings for the "Existing Program + New Measures" include the measures that have been run during the time period of 2005 and 2009 as submitted by each individual contractor in addition to the three new measures evaluated for each contractor. The new measures for each contractor are listed in Table 14.

Program – Tier One Measures

This program was designed to be the future program with full compliance for "Tier One Measures" including all the CUWCC BMPs. Program water savings includes actual achievements for the years 2005 to 2009 and then projected participation rates starting in 2011 in accordance with those specified in the California Urban Water Conservation Council's Memorandum Of Understanding, which may be higher (or lower) than you are currently achieving. If you continue to implement the BMPs as planned, your future demands will be reduced by the amount of savings from Tier One future measures.

Program - Tier One + New Development Measures

Savings for Tier One + New Development Measures were designed to isolate the effects of the New Development measures that would be implemented as well as the completion of Tier One measures. These eight New Development measures target new single family homes, multifamily homes, and commercial development based on the local ordinances or Cal Green as shown in Table 12 and 13.

Program – Tier One + Tier Two Measures

Savings for Tier One + Tier Two Measures includes 13 additional measures beyond the CUWCC BMPs. Tier One Future was designed to be the future program with full compliance for all the CUWCC BMPs. The participation rates starting in 2005 are in accordance with historical conservation efforts for the years 2005 to 2009. Then they proceed with the rate specified in the California Urban Water Conservation Council's Memorandum Of Understanding, which may be higher (or lower) than you are currently achieving. If you continue to implement these measures, your future water demands will be reduced by the amount of conservation savings. Descriptions of the Tier Two measures are in Table 13 and cost and saving assumptions for each individual measure can be found in Attachment A. Note that due to increased regulations and additional research and analysis on conservation measures, measures Tier 2-8, Tier 2-9 and Tier 2-11 were removed from this program at the request of all the contractors on August 2, 2010.

Program: Tier One, Tier Two, New Development

Savings for Tier One, Tier Two, and New Development includes all analyzed conservation measures except for the "new measures" because the new measures are unique to each contractor and did not go through the original measure screening process as the other measures in 2005. Also note that measures that either saved a small amount of water or were not cost-effective (Benefit-Cost ratio less than 1.0 and a high cost of water saved) were included here. Some of the Tier Two measures are small programs in that the target number of accounts is very small. So even though they appear to be relatively expensive from a measure point of view, their impact on the overall program costs and savings is relatively minor. Note that due to increased regulations and additional research and analysis on conservation measures, measures Tier 2-8, Tier 2-9 and Tier 2-11 were removed from this program at the request of all the contractors on August 2, 2010.

Table 16
Conservation Measures Selected for Programs

City of Cotati Conservation Measures in each Program Measure Name	Program Existing	Program Existing & New	Program Tier One	Program Tier One & Tier Two	Program Tier One & ND	Program Tier One & ND & Tier Two
CUWCC #1a - Residential Water Surveys - Interior	✓	✓	✓	✓	✓	✓
CUWCC #1b - Residential Water Surveys - Outdoor	✓	✓	✓	✓	✓	✓
CUWCC #5a - Large Landscape Water Budgets	✓	✓	✓	✓	✓	✓
CUWCC #6 - Washer Rebates	✓	✓	✓	✓	✓	✓
CUWCC #7 - Residential Public Education	✓	✓	✓	✓	✓	✓
CUWCC #9 - Commercial Water Audits	✓	✓	✓	✓	✓	✓
CUWCC #14a - RSF Toilet Replacement	✓	✓	✓	✓	✓	✓
CUWCC #14b - RMF Toilet Replacement	✓	✓	✓	✓	✓	✓
Tier 2 - 1 Rain Sensor Retrofit				✓		✓
Tier 2 - 2 Cash for Grass				✓		✓
Tier 2 - 3 Financial Incentives for Being Below Water Budget				✓		✓
Tier 2 - 5a Smart Irrigation Controller Rebates - RSF				✓		✓
Tier 2 - 5b Smart Irrigation Controller Rebates - RMF, CII, IRR				✓		✓
Tier 2 - 6 Financial Incentives/Rebates for Irrigation Upgrades				✓		✓
Tier 2 - 10 High Efficiency Toilets				✓		✓
Tier 2 - 12 CII Rebates - Replace Inefficient Water Using Equipment				✓		✓
Tier 2 -13 New Commercial Urinals				✓		✓
Tier 2 - ND1 Rain Sensor Retrofit					✓	✓
Tier 2 - ND2 Smart Irrigation Controller	✓	✓			✓	✓
Tier 2 - ND3 High Efficiency Toilets	✓	✓			✓	✓
Tier 2 - ND4 Dishwasher New Efficient	✓	✓			✓	✓
Tier 2 - ND5 Clothes Washing Machine Requirement	✓	✓			✓	✓
Tier 2 - ND6 Hot Water on Demand					✓	✓
Tier 2 - ND7 High Efficiency Faucets and Showerheads	✓	✓			✓	✓
Tier 2 - ND8 Landscape and Irrigation Requirements	✓	✓			✓	✓
SB 407 Requirements (Plumbing Retrofit on Resale or Remodel)		✓				
Caonservation Pricing Measure		✓				

NOTE – Due to increased regulations and additional research and analysis on conservation measures, Measures Tier 2-8, Tier 2-9 and Tier 2-11 were removed from analysis at the request of all the contractors

6.2 Results of Program Evaluation

Figure 8 shows annual water demand with no conservation, plumbing code only, and the six programs. Table 17 shows the savings in 5 year increments for all six programs. The savings in Table 17 are just from the conservation programs alone and do not include the plumbing code savings. The separate starting points for the demand with and without the plumbing code versus the conservation programs is directly correlated to the fact that the contractors have existing conservation programs active from 2005 and 2009 that are already saving water by the year 2010.

Figure 8
Long Term Demands with Conservation Programs

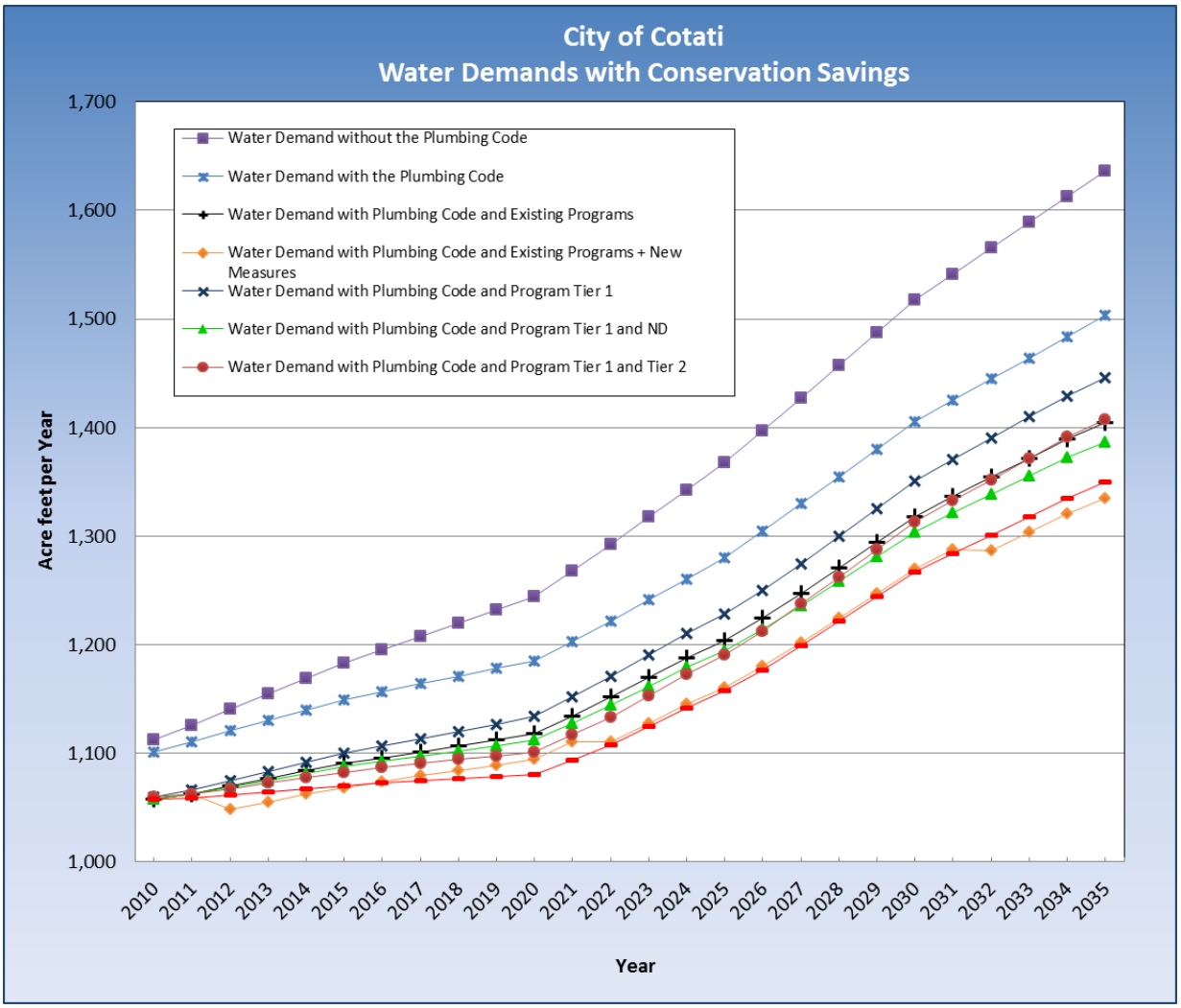


Table 17
Long Term Conservation Program Savings

City of Cotati Water Conservation Savings Conservation Savings (AFY)	2010	2015	2020	2025	2030	2035	Benefit Cost Ratio Utility	Benefit Cost Ratio Community
Existing Programs	44	59	67	76	87	99	2.3	0.7
Existing Programs + New Measures	44	81	90	119	135	169	2.6	0.9
Program Tier 1	42	49	51	52	54	58	1.9	2.2
Program Tier 1 and ND	44	62	73	86	101	116	2.4	0.7
Program Tier 1 and Tier 2	42	67	84	90	92	96	1.2	0.6
Program Tier 1 and ND and Tier 2	44	79	105	123	138	154	1.5	0.5

Figure 9 shows how marginal returns change as more money is spent to achieve savings. As the figure shows the cost versus saving curve is starting to decline after Program Tier One + New Development. This means that the added cost of going from that Program to Tier One + Tier Two will save less water per unit expenditure. In other words there are diminishing returns when the curve starts to flatten out as Tier Two measures are added to the program. It is clear that the New Development measures are more

cost-effective to the utility than Tier Two measures. It is not to say that the Tier Two measures are a poor investment. The decision on which program is appropriate for each agency is dependent on many factors. Most recently it may be impacted by the goals set forth by SB7x-7 which calls for a reduction in per capita was use by 2020, which is independent of the economic analysis.

Figure 9
Present Value of Utility Costs versus Cumulative Water Saved

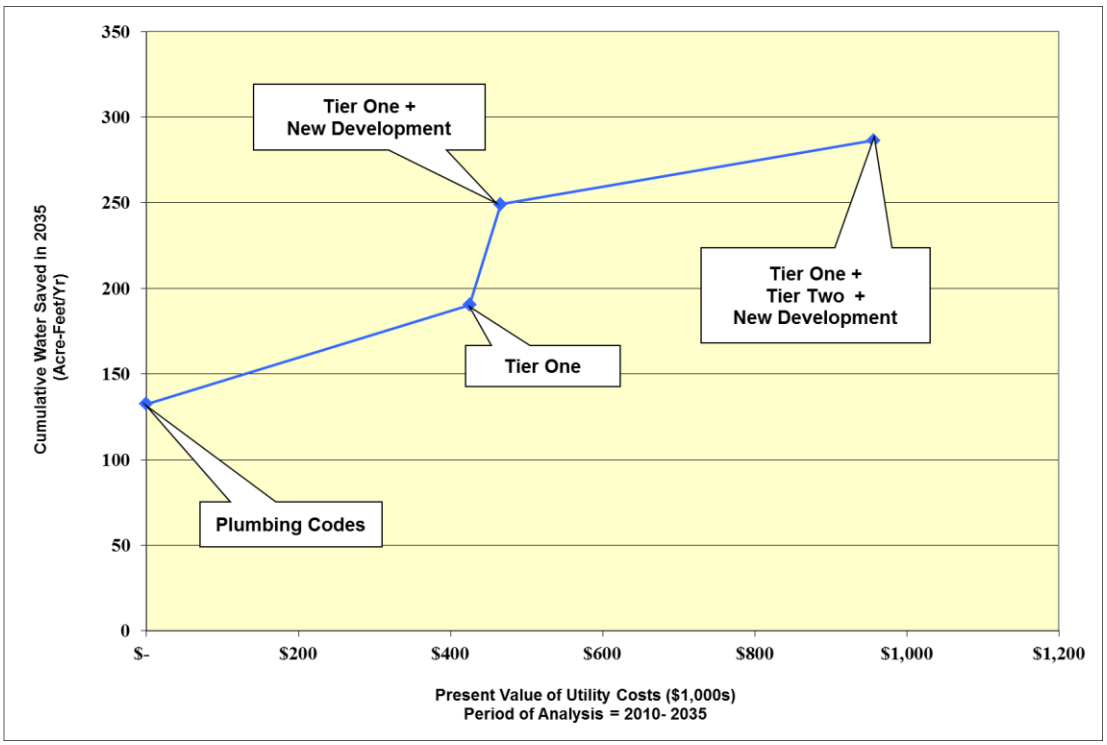


Table 18 presents key evaluation statistics compiled from the DSS Model. Assuming all measures are successfully implemented, projected water savings for 2030 in AF are shown, as are the costs of achieving this reduction. Water savings for programs have been shown for 2035 in Table 18.

The costs are expressed two ways.

1. Total present value over the analysis period,
2. The cost of water saved. Cost of water saved is presented two ways: for the utility and the total community (customer plus utility).

These cost parameters are derived from the annual time stream of utility, customer and community costs.

The water savings are expressed as a percentage of the projected 2035 demand. One column indicates the percentage of the new water demand in 2035 each program could provide. The new water needed by new customers over the full planning period is the difference between 2005 demand and 2035 demand without the plumbing code. The plumbing code is an additional savings that could be added on top of the water savings shown in Table 18. This allows the plumbing code savings percent and water savings in AF/Yr shown in Table 4 and to be additive to the conservation program savings in AF/Yr and percentages shown in Table 18.

Table 18
Comparison of Long-Term Conservation Programs – Utility Costs and Savings

City of Cotati Comparison of Conservation Program Costs and Savings										
Conservation Program	Water Utility Benefit-Cost Ratio	Community Benefit-Cost Ratio	2015 Water Savings (AFY)	2035 Water Savings (AFY)	2035 Indoor Water Savings (AFY)	2035 Outdoor Water Savings (AFY)	Total Water Savings as a % of Total Production in 2035*	Present Value of Water Utility Costs ($1,000)	Total Utility Cost Five Years 2011-2015 ($1,000)	Utility Cost of Water Saved ($/AF)
Existing Program	2.27	0.74	59	99	42	56	6.57%	$456	$92	$223
Existing Program + New Measures	2.56	0.91	81	169	59	110	11.23%	$570	$137	$190
Tier One	1.88	2.22	49	58	21	37	3.85%	$425	$82	$281
Tier One + Tier Two	1.25	0.74	67	96	23	73	6.38%	$916	$388	$406
Tier One + New Development	2.42	0.64	62	116	54	63	7.75%	$466	$94	$206
Tier One + Tier Two + New Development	1.54	0.51	79	154	55	99	10.24%	$957	$401	$319

Notes:

- Present Value is determined using an interest rate of 3%
- Cost of water saved is present value of water utility cost divided by total 30-year water savings.
- * % of water saved refers to the demand without the plumbing code
- Total water savings in 2035 as a percent of production is relative to no plumbing code production
- Conversion 1 MGD is equal to1120 AF/Yr

7. CONCLUSIONS

7.1 Relative Savings and Cost-Effectiveness of Programs

The City of Cotati service area has a relatively high portion of residential water use and a significant amount of outdoor water use. Consequently, residential conservation programs produce the most savings. City of Cotati's service area is not a heavy manufacturing sector so the conservation potential in the commercial sector is relatively low. Based on the assumed avoided cost of new water, water conservation programs are cost-effective. Overall conclusions are:

- The decrease in demand for Cotati compared to the water demand projections in the 2005 Demand and Water Conservation Measure Analysis completed by MWM was due to the reduction in employment projections and the change to lower water factors for each customer category used to project the water use for each customer category. The water factors decreased for all contractors compared to the 2005 study.
- Watersavings from implementation of the Tier One, Tier Two and New Development conservation programs would reduce water needs in 2035 by about 10.2 percent (154 AF/Yr as shown on Table 18) when compared to the water demands in 2035 without the plumbing code.
- Water savings from implementation of the Tier One conservation programs would reduce water needs in 2035 by about 3.85 percent (58 AF/Yr) as shown on Table 18) when compared to the water demands in 2035 without the plumbing code.
- For Future Tier One measures, more than half of the conservation potential in 2035 is in reducing outdoor use; the rest is indoor use reduction potential.
- The average cost of water saved over 30-years is lower than the current price of SCWA water. Thus measures that are cost-effective at today's water rates will be more so if SCWA rates rise in the future.
- Savings contributed by Tier Two measures alone are 38 acre-feet in 2035.
- Savings contributed by the New Development measures alone are 59 acre-feet in 2035.
- Benefit-cost ratios of program combinations range from 1.25 to 2.57 so all program combinations are cost-effective from the utility standpoint.
- The average cost of water saved for all of the programs from the utility standpoint (as shown on Table 18) is lower than the forecasted 2025 price of $827 per AF.
- The cost for the new development measures is largely funded by the builders of the new homes, which tends to reduce the overall cost to the utility for all measures.

Appendix A - Assumptions for Water Conservation Measures Evaluated in the DSS Model

	BMP 1a Residential Audits	**BMP 1a Residential Audits**	**BMP 1b Residential Audits**	**BMP 1b Residential Audits**	**BMP 2 Plumbing Retrofits**
Account Category	RSF	RMF	RSF	RMF	RSF / RMF
Affected End Uses	Internal	Internal	External	External	Toilets, Faucets, Showers
Percent Reduction in Water Use	5%	5%	10%	10%	5%/5%/21%
CUWCC MOU Sign-on Year	2001	2001	2001	2001	2001
Evaluation Start Year	2005	2005	2005	2005	2005
Required Interventions Starting in 2005 (Accounts)	127	2	127	2	0
Market Penetration by End Of Program,%	15	15	15	15	75
Measure Life (years)	7	7	7	7	Permanent
Initial Cost	$ -	$ -	$ -	$ -	$ -
Utility Unit Cost, per site one time cost	$40.00	$80.00	$40.00	$50.00	$30.00
Customer Unit Cost to achieve savings	$10.00	$30.00	$5.00	$20.00	$0
Administration Cost, percent of unit cost	25%	25%	25%	25%	10%
Affected Units	dwelling unit	dwelling unit	dwelling unit	dwelling unit	1992 and older dwelling units
Comments	Assume audits are renewed every 7 years to maintain water savings				BMP Complete

Notes:

RSF = Residential Single Family
RMF = Residential Multi Family
BUS/COM= Commercial
IND = Industrial
IRR = Dedicated irrigation meters
INS = Institutional/Public, buildings / grounds owned by the Water Utility or City
NRSF = New Single Family Homes
GOV = Government

	BMP 5a Water Budgets	BMP 5b Water Audits	BMP 6 Washer Rebates	BMP 7 Public Education	BMP 9 CII Audits	BMP 14 Toilet Rebates
Account Category	IRR	BUS	RSF	RSF/RMF	BUS/INS	RSF/RMF
Affected End Uses	Irrigation	Irrigation	Laundry	All	All	Internal
Percent Reduction in Water Use	15%	15%	34%	1%	12%	60%
CUWCC MOU Sign-on Year	2001	2001	2001	2001	2001	2001
Evaluation Start Year	2005	2005	2005	2005	2005	2005
Required Interventions Starting in 2005 (Accounts)	95	0	0	1,777	31	105/3
Market Penetration by End Of Program, %	90	15	4.8	100	10	Match resale rate
Measure Life (years)	10	10	Permanent	2	Permanent	Permanent
Initial Cost	$ -	$ -	$ -	$ -	$ -	NA
Utility Unit Cost, per site one time cost	$400.00	$1,500.00	$75.00	$2.50	$4,000.00	$50
Customer Unit Cost to achieve savings	$ -	$1,000.00	$200.00	$ -	$2,000.00	$75
Administration Cost, percent of unit cost	15%	30%	30%	25%	50%	included
Affected Units	Irrigation accounts	large landscape accounts	per dwelling unit	per dwelling unit	CII accounts	per toilet
Comments	Assume audits are renewed every 10 years to maintain water savings		BMP 6 complete			

Notes:
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IND = Industrial
IRR = Dedicated irrigation meters
INS = Institutional/Public, buildings / grounds owned by the Water Utility or City
NRSF = New Single Family Homes
GOV = Government

Measure	T2 - 1	T2 - 2	T2 - 3	T2 - 4	T2 - 5a	T2 - 5b	T2 - 6
	Rain-sensor (shut off device) retrofit on irrigation controllers	Cash for Grass (turf removal program)	Financial Incentives for Being Below Water Budget	Financial Rebates for Irrigation Meters	Smart Irrigation Controller Rebates	Smart Irrigation Controller Rebates	Financial Incentives/ Rebates for Irrigation Upgrades
Applicable Customer Classes	SF	Existing Customers SF, MF, CII	IRR	--	SF	Existing Customers MF, CII, IRR	Existing Customers MF, CII, IRR
Applicable End Uses	Irrigation	Irrigation	Irrigation	--	Irrigation	Irrigation	Irrigation
Market Penetration by End Of Program	10%	1%	100%	10%	5%	20%	10%
Water Use Reductions For Targeted End Uses	9%	50%	15%	15%	15%	15%	15%
Program Length, years	5	5	10	5	10	10	15
Measure Life, years	10	permanent	permanent	permanent	21	permanent	permanent
Utility Unit Cost for SFaccounts, $/unit	$ 20.00	$ 500.00	$ 25,000.00	$ -	$ 450.00	$ -	$ -
Utility Unit Cost for MF accounts, $/unit	--	$ 500.00	$ -	$ -	$ -	$ 900.00	$ -
Utility Unit Cost for non-Res accounts, $/unit	--	$ 500.00	$ -	$ 500.00	$ -	$ 900.00	$ 500.00
Customer Unit Cost. $/unit	$ 35.00	$ 500.00	$ 10,000.00	$ 500.00	$ 100.00	$ 100.00	$ 500.00
Annual Utility Admin & Marketing Cost	25%	25%	35%	25%	30%	30%	25%

Notes:
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RMF = Residential Multi Family
BUS/COM= Commercial
IND = Industrial
IRR = Dedicated irrigation meters
INS = Institutional/Public, buildings / grounds owned by the Water Utility or City
NRSF = New Single Family Homes
GOV = Government

Measure	T2 - 7	T2 - 10	T2 - 12	T2 - 13
	Hotel retrofit (w/financial assistance) - CII Existing	High Efficiency Toilet (HET)	CII Rebates - replace inefficient water using equipment	0.5 gal/flush urinals in new buildings
Applicable Customer Classes	--	SF, MF	CII	COM New
Applicable End Uses	--	Toilet end use	Process end use	COM Urinal
Market Penetration by End Of Program	20%	20%	10%	100%
Water Use Reductions For Targeted End Uses	20%	45 to 55%	10%	65 to 75%
Program Length, years	15	10	15	30
Measure Life, years	permanent	permanent	permanent	permanent
Utility Unit Cost for SFaccounts, $/unit	$ -	$ 150.00		$ 50.00
Utility Unit Cost for MF accounts, $/unit	$ -	$ 150.00		
Utility Unit Cost for non-Res accounts, $/unit	$ 100.00		$ 500.00	
Customer Unit Cost. $/unit	$ 200.00	$ 150.00	$ 1,000.00	$ 500.00
Annual Utility Admin & Marketing Cost	25%	35%	30%	25%

Notes:

RSF = Residential Single Family
RMF = Residential Multi Family
BUS/COM= Commercial
IND = Industrial
IRR = Dedicated irrigation meters
INS = Institutional/Public, buildings / grounds owned by the Water Utility or City
NRSF = New Single Family Homes
GOV = Government

Measure	ND 1	ND 2	ND 3	ND 4	ND 5	ND 6	ND 7	ND 8
	Rain-sensor shut off device on irrigation controllers	Smart Irrigation Controller	High Efficiency Toilet (HET)	Dishwasher New Efficient	Clothes washing machines requirement for new residential	Hot Water on Demand	High efficiency faucets and showerheads	Landscape and irrigation requirements
Applicable Customer Classes*	Varies	Varies	Varies	Varies	Varies	Varies	Varies	Varies
Applicable End Uses	Irrigation	Irrigation	Toilet end use	Dishwasher end use	Clothes Washer end use	Faucet and shower end use	Faucet and shower end use	Irrigation
Market Penetration by End Of Program	100%	100%	100%	100%	100%	100%	100%	100%
Water Use Reductions For Targeted End Uses	9%	15%	50 to 55%	34%	50%	14.2 gpd per house	15%	10%
Program Length, years	30	30	30	30	30	30	30	30
Measure Life, years	permanent	permanent	permanent	permanent	permanent	permanent	permanent	permanent
Utility Unit Cost for SFaccounts, $/unit	$ 12.50	$ 12.50	$ 12.50	$ 12.50	$ 12.50	$ 12.50	$ 12.50	$ 12.50
Utility Unit Cost for MF accounts, $/unit	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Utility Unit Cost for non-Res accounts, $/unit	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Customer Unit Cost. $/unit	$ 55.00	$ 500.00	$ 300.00	$ 400.00	$ 500.00	$ 700.00	$ 50.00	$ 3,000.00
Annual Utility Admin & Marketing Cost	10%	10%	10%	10%	10%	10%	10%	10%

Notes:

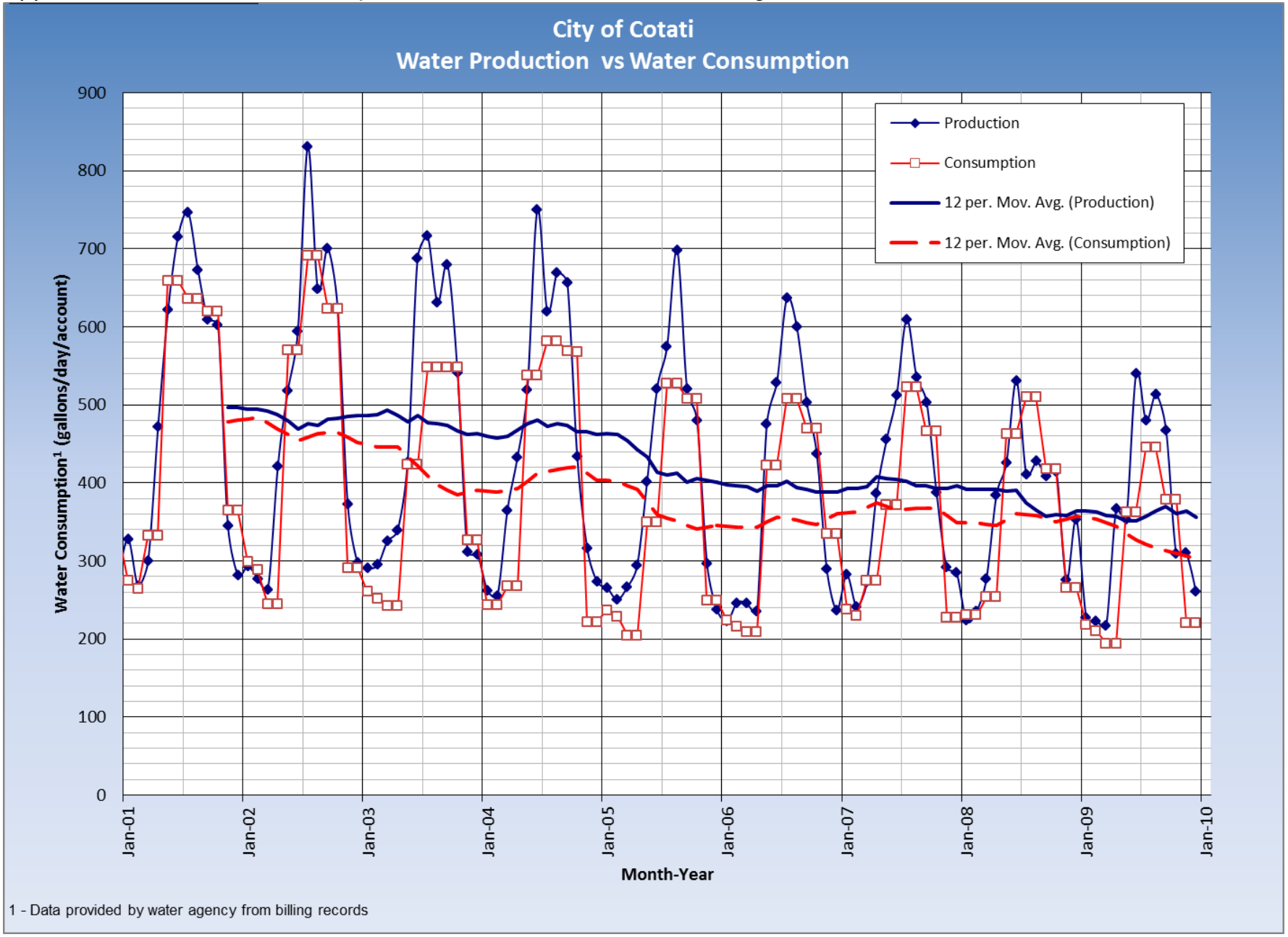
RSF = Residential Single Family
RMF = Residential Multi Family
BUS/COM= Commercial
IND = Industrial
IRR = Dedicated irrigation meters
INS = Institutional/Public, buildings / grounds owned by the Water Utility or City
NRSF = New Single Family Homes
GOV = Government
*Customer class varies depending upon local ordinances, Cal Green and contractor request of new measure or planned ordinances

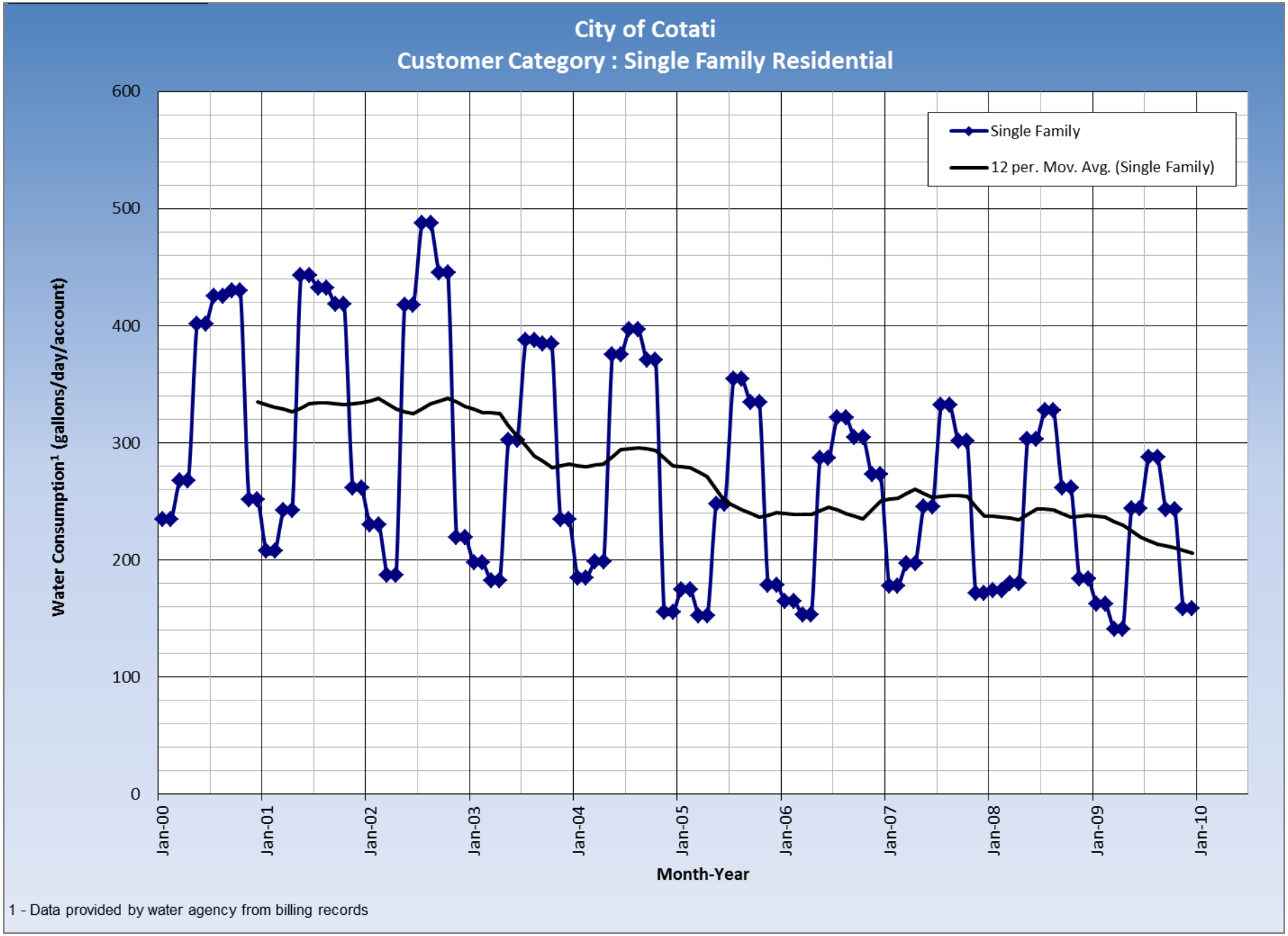
Fixture Replacement SB 407	
Pre-1994 Existing Accounts	
Toilet, urinal, shower, lavatory faucet	
4% SF, 2% MF and CII	
1% 2017-2020 SF, 1% 2019-2020 MF,1% CII 2019-2020	
Varies	
2014	
2020	
7	
Permanent	
$	25
$	25
$	25
Varies	
Varies	
Varies	
25%	
Dwelling unit or CII account	
Measure will start in the year 2017 (SF) and 2019 (CII) to coincide with the California State Law SB 407. Work with the real estate industry to require a certificate of compliance be submitted to the City that the property and efficient fixtures where either already there or were installed at the time of sale, before close of escrow. Consider allowing this certification to be made as a part of the conventional private building inspection report process.	

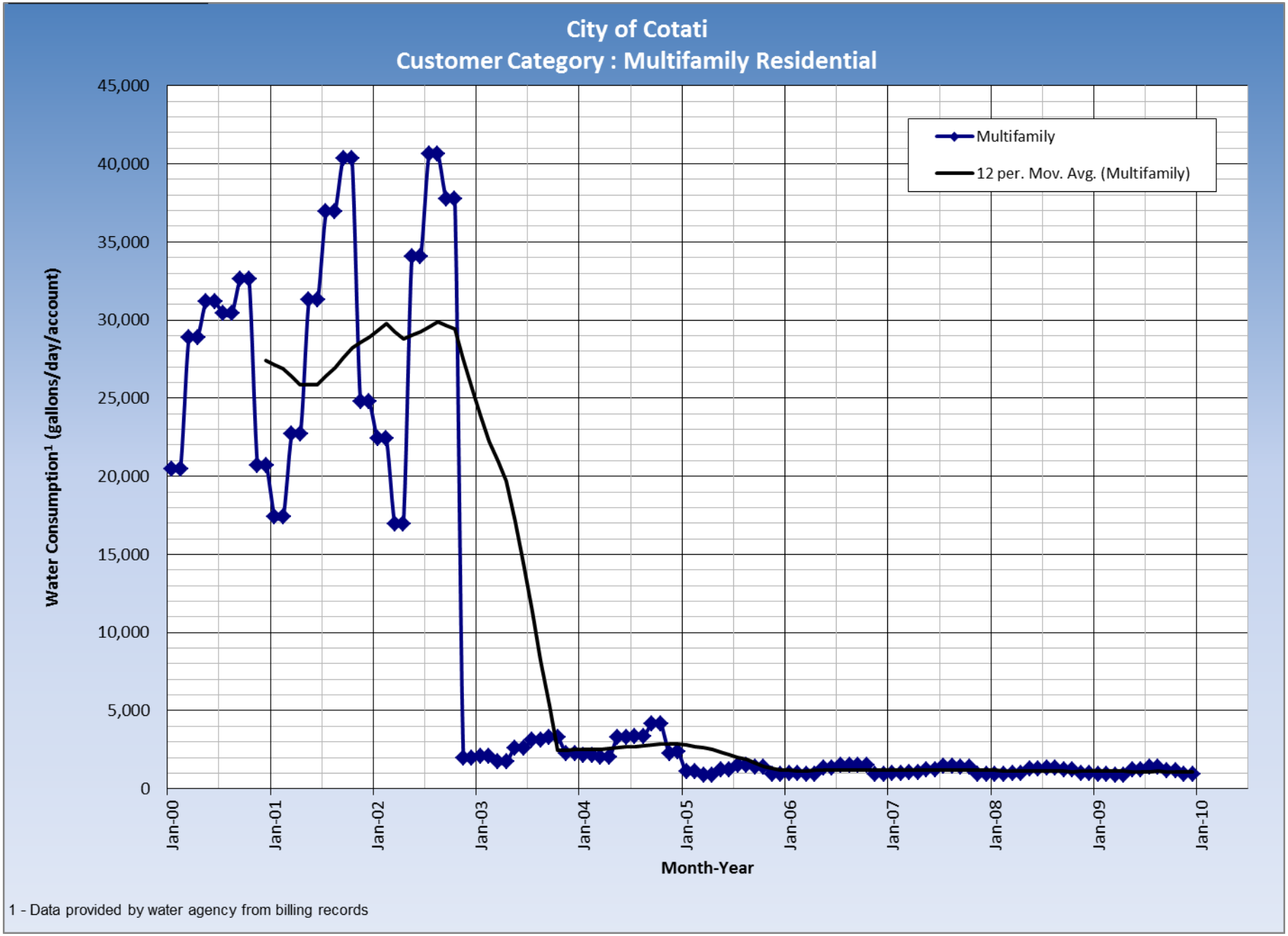
Notes:

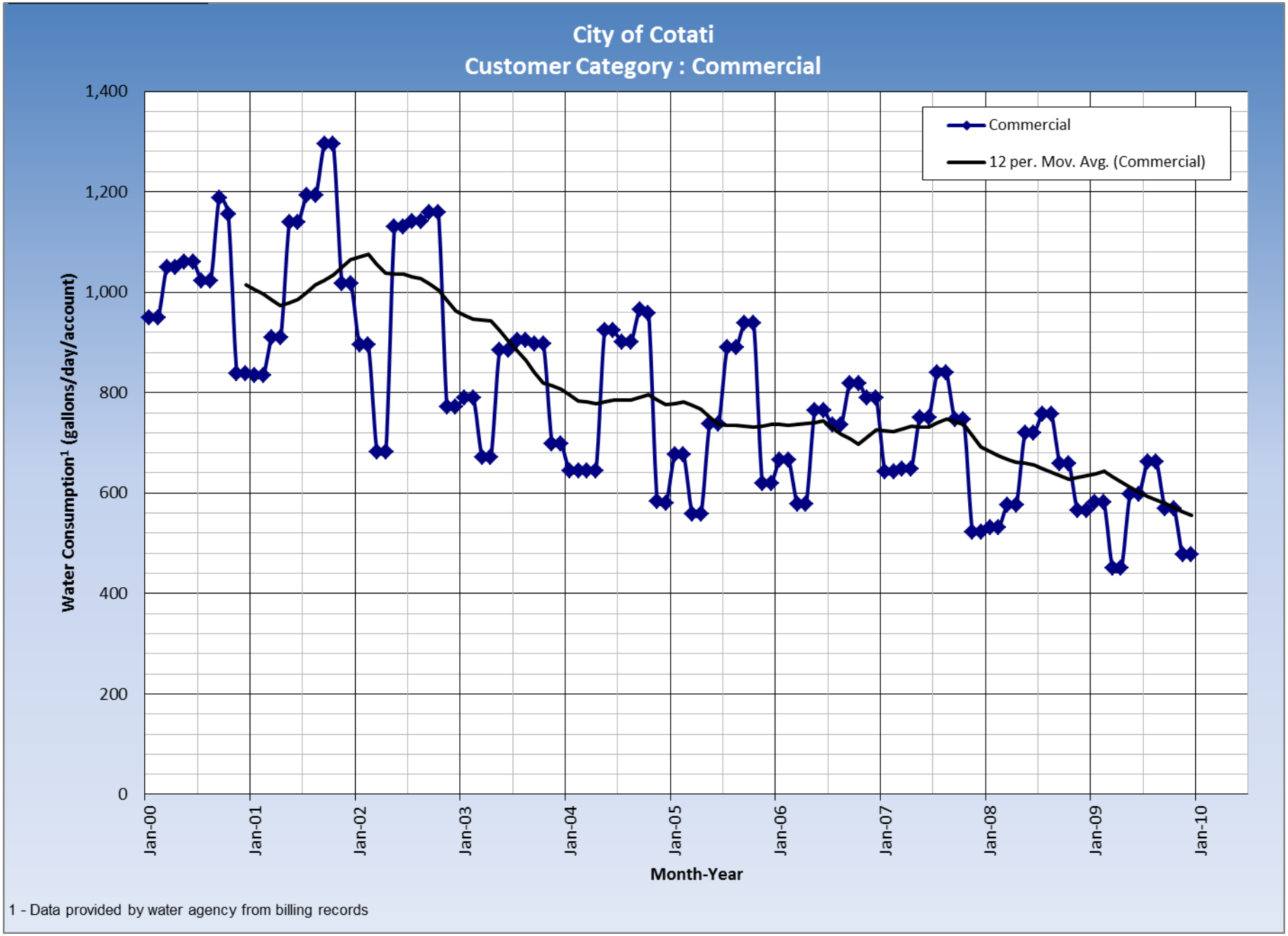
RMF = Residential Multi Family
CII = Commercial, Industrial and Institutional

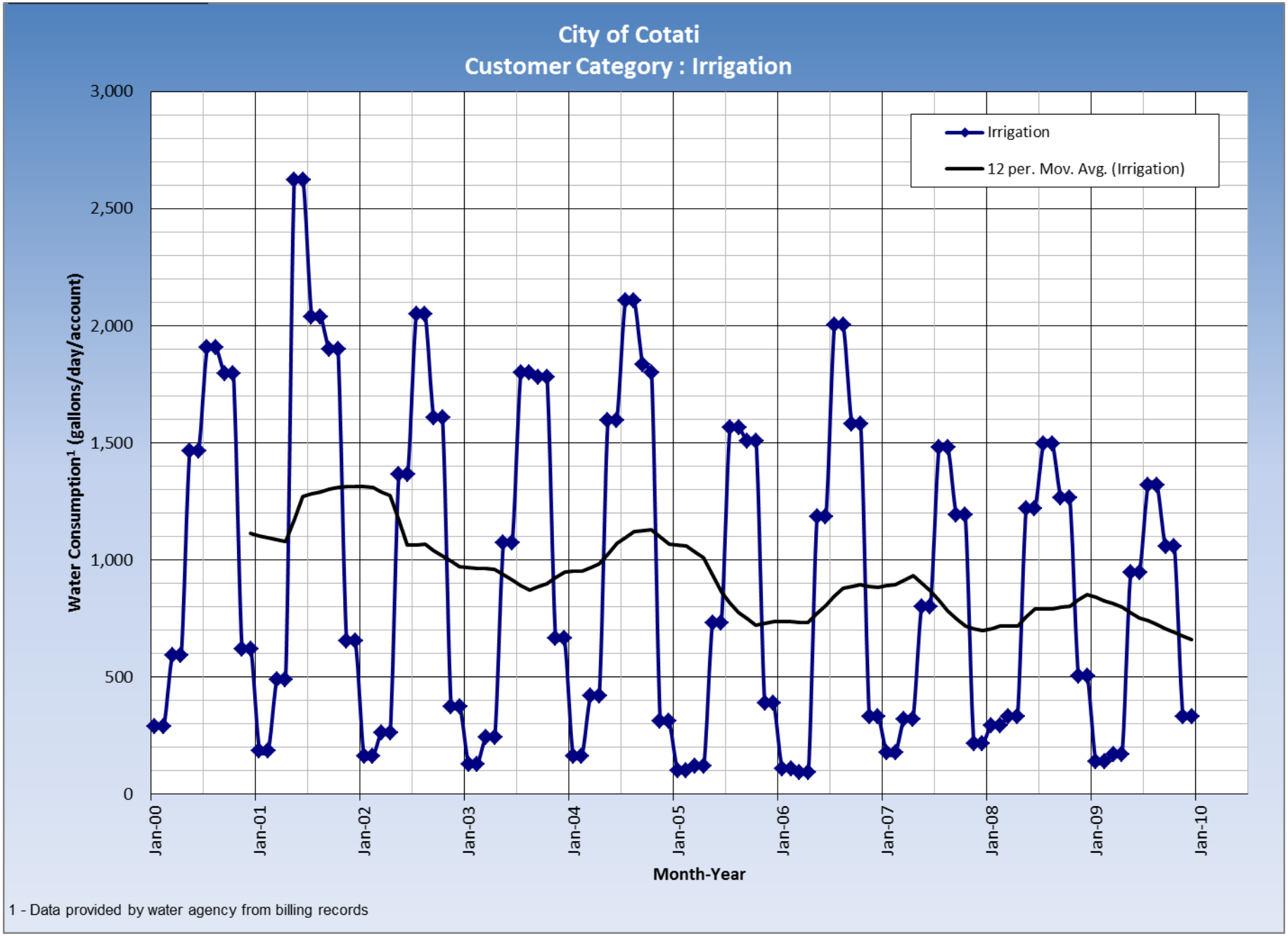
Appendix B - Water Use Data Graphs for Production and Customer Categories

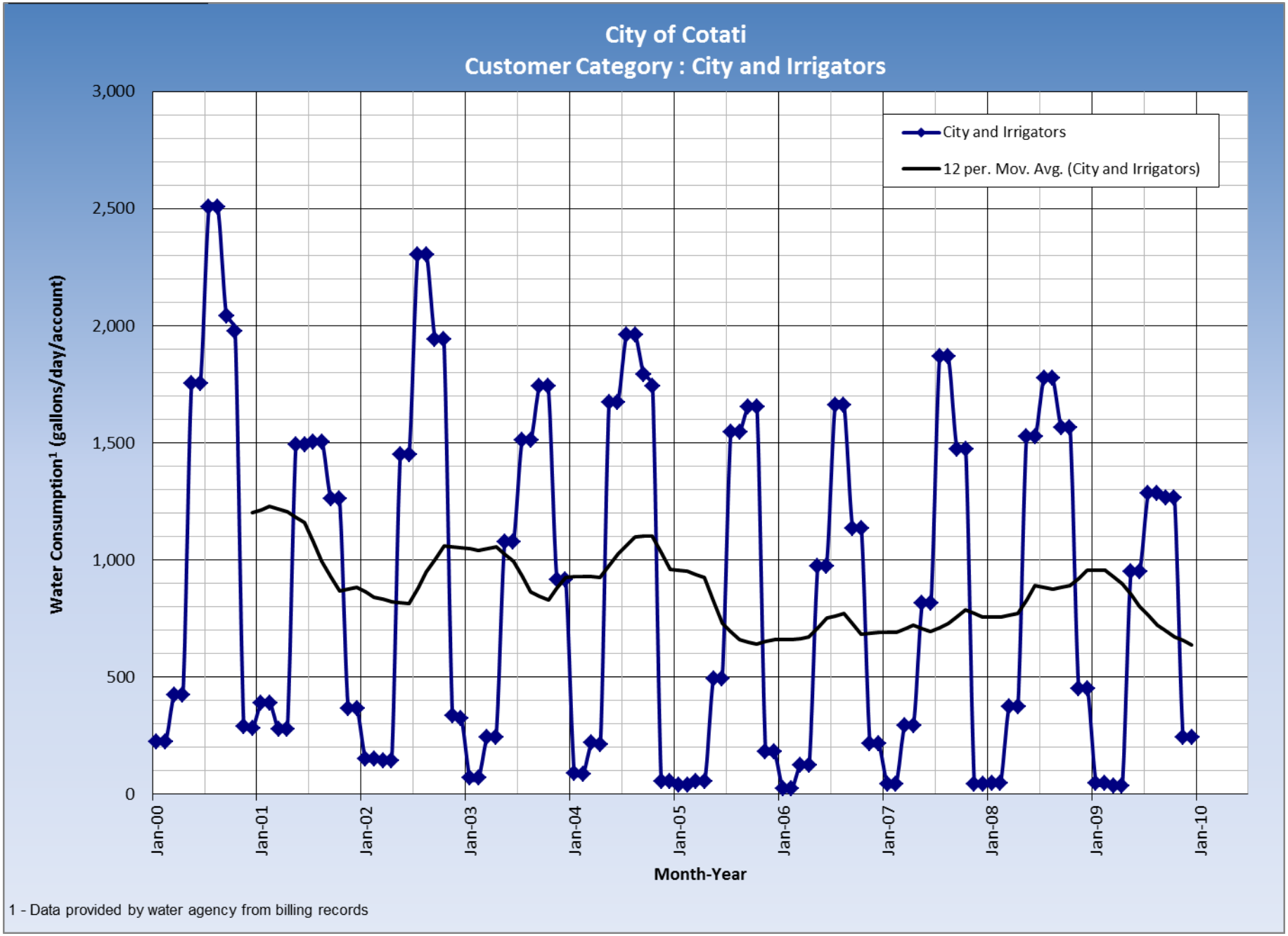


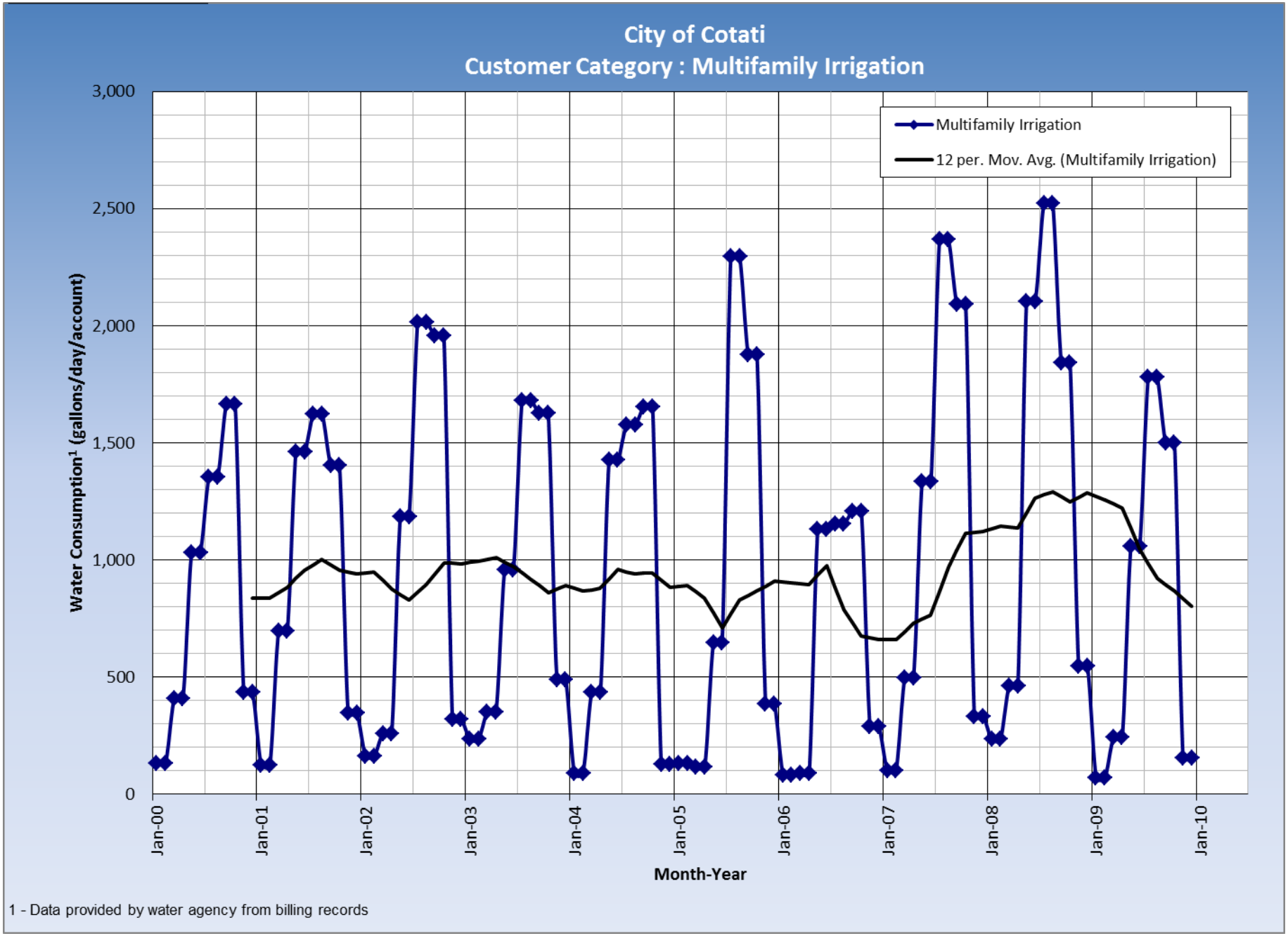

City of Cotati
Customer Category : Single Family Residential
Single Family
12 per. Mov. Avg. (Single Family)
Water Consumption[1] (gallons/day/account)
600
500
400
300
200
100
0
Jan-00
Jan-01
Jan-02
Jan-03
Jan-04
Jan-05
Jan-06
Jan-07
Jan-08
Jan-09
Jan-10
Month-Year
1 - Data provided by water agency from billing records


City of Cotati
Customer Category : Multifamily Residential
Water Consumption[1] (gallons/day/account)
45,000
40,000
35,000
30,000
25,000
20,000
15,000
10,000
5,000
0
Jan-00
Jan-01
Jan-02
Jan-03
Jan-04
Jan-05
Jan-06
Jan-07
Jan-08
Jan-09
Jan-10
Month-Year
Multifamily
12 per. Mov. Avg. (Multifamily)
1 - Data provided by water agency from billing records


City of Cotati
Customer Category : Commercial
Commercial
12 per. Mov. Avg. (Commercial)
Water Consumption[1] (gallons/day/account)
1,400
1,200
1,000
800
600
400
200
0
Jan-00
Jan-01
Jan-02
Jan-03
Jan-04
Jan-05
Jan-06
Jan-07
Jan-08
Jan-09
Jan-10
Month-Year
1 - Data provided by water agency from billing records


City of Cotati
Customer Category : Irrigation
Irrigation
12 per. Mov. Avg. (Irrigation)
Water Consumption[1] (gallons/day/account)
3,000
2,500
2,000
1,500
1,000
500
0
Jan-00
Jan-01
Jan-02
Jan-03
Jan-04
Jan-05
Jan-06
Jan-07
Jan-08
Jan-09
Jan-10
Month-Year
1 - Data provided by water agency from billing records


City of Cotati
Customer Category : City and Irrigators
City and Irrigators
12 per. Mov. Avg. (City and Irrigators)
Water Consumption[1] (gallons/day/account)
3,000
2,500
2,000
1,500
1,000
500
0
Jan-00
Jan-01
Jan-02
Jan-03
Jan-04
Jan-05
Jan-06
Jan-07
Jan-08
Jan-09
Jan-10
Month-Year
1 - Data provided by water agency from billing records


City of Cotati
Customer Category : Multifamily Irrigation
Multifamily Irrigation
12 per. Mov. Avg. (Multifamily Irrigation)
Water Consumption[1] (gallons/day/account)
3,000
2,500
2,000
1,500
1,000
500
0
Jan-00
Jan-01
Jan-02
Jan-03
Jan-04
Jan-05
Jan-06
Jan-07
Jan-08
Jan-09
Jan-10
Month-Year
1 - Data provided by water agency from billing records

APPENDIX C – SONOMA COUNTY WATER AGENCY RESTRUCTURED AGREEMENT FOR WATER SUPPLY

RESTRUCTURED AGREEMENT FOR WATER SUPPLY

by and between

SONOMA COUNTY WATER AGENCY
CITY OF COTATI
CITY OF PETALUMA
CITY OF ROHNERT PARK
CITY OF SANTA ROSA
CITY OF SONOMA
FORESTVILLE WATER DISTRICT
NORTH MARIN WATER DISTRICT
VALLEY OF THE MOON WATER DISTRICT
TOWN OF WINDSOR

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RESTRUCTURED AGREEMENT FOR WATER SUPPLY

THIS AGREEMENT is made on _____ by and between the following public entities:

SONOMA COUNTY WATER AGENCY, herein called "Agency",
CITY OF COTATI, herein called "Cotati",
CITY OF PETALUMA, herein called "Petaluma",
CITY OF ROHNERT PARK, herein called "Rohnert Park",
CITY OF SANTA ROSA, herein called "Santa Rosa",
CITY OF SONOMA, herein called "Sonoma",
FORESTVILLE WATER DISTRICT, herein called "Forestville",
NORTH MARIN WATER DISTRICT, herein called "North Marin",
VALLEY OF THE MOON WATER DISTRICT, herein called "Valley of the Moon", and
TOWN OF WINDSOR, herein called "Windsor",

The parties hereto hereby mutually covenant and agree as follows:

PART 1 - GENERAL

1.1 Recital of Purposes

Among the purposes of this Agreement are to provide a water supply or a supplemental water supply for each of the Water Contractors, to encourage water conservation and recycled water use that reduces potable water use, to provide environmental improvements and enhancements to allow for sustainable and continued use of Russian River Project water, to encourage the development of local supply projects to offset potable water use, and to provide for payment to the Agency for water delivered hereunder sufficient to enable it to pay the capital costs of major replacements and additions to the Transmission System and to meet its Revenue Bond Obligations and its expenses of operating and maintaining the Transmission System.

1.2 Definitions

When used herein, unless otherwise distinctly expressed or manifestly incompatible with the intent of this Agreement, the terms:

(a) "Acre feet" and "AF" mean one acre-foot or 325,850 gallons of water.

(b) "Additional Facilities" means the additional facilities that must be constructed or acquired after the completion of the Russian River-Cotati Intertie in order for the Agency to be able to make the deliveries authorized by Sections 3.1 and 3.2, including, but not limited to: an aqueduct generally paralleling the Intertie Aqueduct; an aqueduct generally paralleling the south part of the Petaluma Aqueduct from the Intertie Aqueduct to Kastania Reservoir; an aqueduct generally paralleling the Sonoma Aqueduct; an aqueduct connecting the Kawana Springs and Ralphine reservoirs; the transmission line pumping plants necessary to regulate flows to Storage Facilities; 55.5 million gallons of reservoir storage; 56.9 mgd of Russian River water production capacity; water-treatment facilities; and Emergency Wells.

(c) "Aqueduct Facilities" means the pipelines of the Intertie, Petaluma, Santa Rosa and Sonoma Aqueducts, an additional pipeline to be constructed generally paralleling the Intertie Aqueduct, a pipeline to be constructed generally paralleling the south part of the Petaluma Aqueduct from the Intertie Aqueduct to Kastania Reservoir, and a pipeline to be constructed or acquired generally paralleling the Sonoma Aqueduct.

(d) "Capital Cost" means the total funds expended for capital improvements, major replacements, or portions thereof, as context requires, including, but not limited to, planning, engineering, environmental impact analysis, right of way, financial and legal fees, interest during construction, and materials, construction, and replacement costs.

(e) "Common Facilities" means all Transmission System facilities except Storage Facilities and Aqueduct Facilities, but including additional facility aqueduct capacity constructed specifically to make the deliveries that have been authorized by Section 3.12, and including the Potter Valley Project or portion thereof if acquired pursuant to Section 2.4.

(f) "Corporate Territory" means the boundary from time to time existent of a city, agency, district or other governmental entity with powers to accept and distribute water.

(g) "Customer" means any of the following customers of the Agency:

(1) "Water Contractor" means a party signatory to this Agreement except the Agency and Forestville.

(2) "Other Agency Customer" means the Agency, the County of Sonoma, California-American Water Company (with respect to the Larkfield Water District), Forestville Water District, Lawndale Mutual Water Company, Kenwood Village Water Company, Penngrove Water Company, the City of Sebastopol, the State of California, and Santa Rosa Junior College.

(3) "Marin Municipal" means the Marin Municipal Water District.

(4) "Russian River Customer" means any Agency customer within Sonoma County who has or in the future will have contracts with the Agency to divert or redivert water directly from the Russian River or Dry Creek without the use of the Transmission System.

(5) "Regular Customer" means the any of the Water Contractors or the Other Agency Customers.

(h) "Emergency Wells" means auxiliary groundwater production wells that may be utilized to provide additional delivery capacity when necessary due to drought, equipment failure, or other transmission capacity impairment, inability to divert Russian River Project water (for water quality reasons or otherwise), or any other reason beyond the control of the Agency.

(i) "Entitlement" means the quantity of water a Regular Customer shall from time to time require at such rates of flow as are necessary to meet its peak day's demand, subject to the delivery limitations set forth in Sections 2.2, 3.1, 3.2, and 3.5.

(j) "Entitlement Limits" means the maximum amounts of water the Agency is obligated to deliver to any Regular Customer from the Transmission System, as specified in Sections 3.1(a), 3.2(a), 3.2(c), and 3.2(d).

(k) "Fiscal Year" (abbreviated FY) means the period from July 1 through the following June 30.

(l) "Forestville Aqueduct" means the existing pipeline from the Santa Rosa Aqueduct to Forestville, the existing booster pumping plant, the existing 300,000-gallon reservoir, and all other facilities financed with the proceeds of the sale of Series E of the Agency's 1955 Bonds.

(m) "Intertie Aqueduct" means the existing 48-inch inside diameter pipeline extending from the Mirabel Park intake facilities on the Russian River to the Petaluma Aqueduct in the vicinity of Cotati with appurtenances thereto including turnouts to serve Forestville, Santa Rosa, Cotati and Rohnert Park. The Intertie Aqueduct consists of three reaches: "Reach 1" from the Mirabel intake facilities to Forestville, "Reach 2" from Forestville to the extension of Hall Road and "Reach 3" from the extension of Hall Road to the junction with the Petaluma Aqueduct at Cotati. Reach 3 is further divided into "Reach 3a" from the extension of Hall Road to Occidental Road, "Reach 3b" from Occidental Road to the Cotati reservoirs and "Reach 3c" from the Cotati reservoirs to the Petaluma Aqueduct.

(n) "Kawana Pipeline" means the pipeline connecting the Reach 3a of the Intertie Aqueduct with Kawana Springs Reservoirs.

(o) "Local Supply Project" means a water supply project undertaken by one or more Water Contractors, which reduces demand on the Transmission System during the months of June, July, August, or September.

(p) "Marin Municipal" means the Marin Municipal Water District.

(q) "mgd" means a million gallons of water per day.

(r) "Oakmont Pipeline" means that certain pipeline and appurtenances generally parallelling the Sonoma Aqueduct that were constructed by the Agency pursuant to an agreement between the City of Santa Rosa and Agency dated April 29, 1986.

(s) "Operation and Maintenance Costs" means the Agency's costs of operating the Transmission System including its power costs, costs of maintaining the Transmission System in a good state of repair, payments made to the owner of the Potter Valley Project to insure the continued operation of the Potter Valley Project provided they are annually approved by the Water Advisory Committee, regardless of whether or not such payments result in the ultimate transfer of title to all or part of the Potter Valley Project to the Agency, and costs of administering the Transmission System and furnishing the water supplies pursuant to this Agreement; provided, however, that costs relating to the use of Transmission System facilities for public recreation purposes, except (1) costs to permit limited passive public recreation on Transmission System lands not in conflict with operational or water quality requirements, or (2) necessary

costs associated with land ownership, shall not constitute "Operation and Maintenance Costs."

(t) "Ordinance No. 1" means Ordinance No. 1 of the Agency adopted on December 28, 1970, providing for the issuance of the Revenue Bonds, together with any other ordinances of the Agency supplemental thereto or amendatory thereof.

(u) "Other Agency Customer" means the Agency, the County of Sonoma, California-American Water Company (with respect to the Larkfield Water District), Forestville Water District, Lawndale Mutual Water Company, Kenwood Village Water Company, Penngrove Water Company, the City of Sebastopol, the State of California, and Santa Rosa Junior College.

(v) "Petaluma Aqueduct" means the existing pipeline and appurtenances, including turnouts, from the Santa Rosa Aqueduct to Petaluma. The "south part" of the Petaluma Aqueduct means the portion thereof south of the junction thereof with the Intertie Aqueduct and the "north part" means the portion north of said junction to Scenic Avenue.

(w) "Potter Valley Project" means Federal Energy Regulatory Commission Project No. 77.

(x) "Recycled Water" means wastewater treated to applicable standards set forth in Title 22 of the California Code of Regulations, Division 4 Environmental Health, as may be amended from time to time.

(y) "Recycled Water and Local Supply Sub-Charge" and "Recycled Water and Local Supply Fund" mean the sub-charge and fund established by the Agency under Section 4.15.

(z) "Recycled Water Project" means any programs, projects, or facilities that produce or deliver recycled water, provided that the recycled water produced or delivered by such projects or facilities (1) results in a reduction in use of potable water from the Transmission System, (2) reduces the amount of water diverted from the Russian River or its tributaries, (3) provides an environmental benefit which increases or avoids reduction to the water supply or Transmission System capacity available to the Water Contractors, or reduces the cost of providing such supply or capacity, or (4) assists the Agency to comply with the federal or state Endangered Species Act or any other environmental law or regulation, which compliance is required for the Agency to

provide the water supply or Transmission System capacity to the Water Contractors as provided in this Agreement.

(aa) "Regular Customer" means the any of the Water Contractors or the Other Agency Customers.

(bb) "Remaining Facilities" means those portions of the Russian River-Cotati Intertie authorized to be constructed or acquired by the Tenth Amended Agreement For Water Supply and Construction of the Russian River-Cotati Intertie Project, dated November 14, 1997, which have not been constructed or acquired on the effective date of this Agreement, including, but not limited to, 20 mgd of standby pump and collector capacity; the Wohler-Forestville pipeline; the Eldridge-Madrone pipeline; Collector No. 6, and the Oakmont Pipeline.

(cc) "Revenue Bond Obligations" means the payment of principal of and interest on the Revenue Bonds and all other obligations and covenants of the Agency with respect to the Revenue Bonds, including specifically any covenant to establish and maintain rates and charges to provide revenue coverage in excess of a specified amount.

(dd) "Revenue Bonds" means any of the following if issued or entered into for sole purpose of financing the Capital Cost of Transmission System facilities or other facilities authorized to be constructed, acquired, or funded under this Agreement: (1) all series or issues of revenue bonds issued pursuant to ordinances and resolutions of the Agency or of any joint powers authority of which the Agency is a member or (2) any loan agreement, grant agreement, lease-purchase agreement, certificate of participation agreement, note, commercial paper, or other debt or financing agreement entered into by the Agency or by any joint powers authority of which the Agency is a member. As used in this Agreement, the term "issue Revenue Bonds" includes entering into any of the agreements set forth in clause (2) of the preceding sentence, and the term "holders of Revenue Bonds" includes any holders of or counterparties to any such agreements.

(ee) "Russian River Conservation Charge" means the charge established in Subsection (a) of Section 4.18 of this Agreement.

(ff) "Russian River-Cotati Intertie" means the Intertie Aqueduct and associated intake facilities on the Russian River, including the diversion dam, intake works, infiltration ponds, collectors, water treatment facilities, groundwater wells having a minimum production capacity of 7 mgd, a Russian River water quality monitoring system,

pumps, telemetry equipment and related buildings and appurtenances, and associated storage facilities.

(gg) "Russian River Customer" means any Agency customer within Sonoma County who has or in the future will have contracts with the Agency to divert or redivert water directly from the Russian River or Dry Creek without the use of the Transmission System.

(hh) "Russian River Project" means Coyote Valley Dam/Lake Mendocino on the Russian River, Warm Springs Dam/Lake Sonoma on Dry Creek, and related works as contemplated by House Document Number 585, 81st Congress, 2nd Session, House Document Number 547, Eighty-Seventh Congress, Agency Board of Directors Resolutions No. 6847 adopted May 24, 1955, No. 7798 adopted September 27, 1955, No. DR00793-1 adopted September 25, 1961 and Resolution No. DR68485 adopted December 23, 1980, or any agreement between the Agency and the United States related to Coyote Valley Dam or Warm Springs Dam.

(ii) "Russian River Projects Charge" means the charge established in Subsection (b) of Section 4.18.

(jj) "Russian River Projects Fund" means the fund established by the Agency to pay or partially pay for: (1) carrying out the Agency's Coyote Valley Dam Project and Warm Springs Dam Project channel-stabilization works obligations to the United States Government and the State of California under Agency Board of Directors Resolutions No. 6847 adopted May 24, 1955, No. 7798 adopted September 27, 1955, No. DR00793-1 adopted September 25, 1961 and Resolution No. DR68485 adopted December 23, 1980; (2) securing and defending appropriative water rights which are necessary for the realization of the full benefits of the Coyote Valley Dam and Warm Springs Dam Projects; (3) the Agency's share of the United States Government's investment, operation and maintenance, and major replacement costs associated with the Coyote Valley Dam and Warm Springs Dam Projects; (4) the acquisition of all or part of the Potter Valley Project or contributions made to the Project owner to insure the continued operation of all or part of the Project; and (5) fishery mitigation and enhancement projects undertaken by the Agency in the Russian River and Eel River and their tributaries.

(kk) "Santa Rosa Aqueduct" means the existing pipeline and appurtenances, including turnouts, from the collector wells at Wohler to the Ralphine Tank farm on the east extension, and to Scenic Avenue on the south extension.

(ll) "Sonoma Aqueduct" means the existing pipeline and appurtenances, including turnouts, from the Ralphine reservoirs to Sonoma. The Sonoma Aqueduct consists of two reaches: "Reach 1" from the Ralphine reservoirs to Pythian Road and "Reach 2" from Pythian Road to the Sonoma reservoirs.

(mm) "Storage Facilities" means all reservoirs on the Transmission System, the pipeline connecting the Kawana Springs Reservoirs with the Intertie Aqueduct; the pipeline connecting the Kawana Springs and Ralphine reservoirs; the Oakmont Pipeline; the pipeline connecting the Kastania reservoir with the Petaluma Aqueduct; the existing booster pumping plant and the existing 300,000-gallon reservoir components of the Forestville Aqueduct; and transmission line pumping plants necessary to regulate flows to storage facilities.

(nn) "Surplus Customer" means any person or entity who, as of the date of this agreement, was being served Surplus Water by the Agency.

(oo) "Surplus Water" has the meaning defined in subsection (a) of Section 3.4 of this Agreement.

(pp) "Transmission System" means the Agency's water production, storage, treatment and transmission facilities, including but not limited to the Santa Rosa, Petaluma, and Sonoma Aqueducts, the Russian River-Cotati Intertie, Emergency Wells, the Warm Springs Hydroelectric Project, future water production, storage, treatment and transmission facilities to be constructed as set forth in Sections 2.2 and 2.3, and the Potter Valley Project, if acquired by the Agency pursuant to Section 2.4.

(qq) "Trustee" means the Trustee or Trustees for the Agency (or for any joint powers authority of which the Agency is a member) and the holders of the Revenue Bonds appointed pursuant to ordinances or resolutions of the Agency relating to Revenue Bonds, or any successor(s) or assignee(s) thereof.

(rr) "Warm Springs Dam Project" means that certain project authorized for the Russian River, Dry Creek, California, by the Flood Control Act of 1961, enacted October 23, 1962 (Public Law 874, 87th Congress).

(ss) "Warm Springs Hydroelectric Project" means Federal Energy Regulatory Commission Project No. 3351.

(tt) "Water Advisory Committee" means the advisory committee established in Part 5 of this Agreement.

(uu) "Water Conservation Project" means (1) any program, project, or activity that will reduce potable water use within a Regular Customer's service area (including, but not limited to, activities undertaken pursuant to Section 1.12 of this Agreement, but excluding Recycled Water Projects or Local Supply Projects approved after the date of this Agreement), or (2) any materials, supplies, Agency staff time, or contractor services provided by the Agency in support of any Regular Customer's Water Conservation Project.

(vv) "Water Contractor" means a party signatory to this Agreement except the Agency and Forestville.

1.3 Term of Agreement

This Agreement shall become effective upon its execution by all the parties hereto and shall remain in effect until June 30, 2040, or, if any Revenue Bonds are outstanding on June 30, 2040, until such date as all Revenue Bonds shall have been paid in full and all obligations and covenants of the Agency with respect to any Revenue Bonds shall have been discharged. The Agency shall enter into renewal agreements for periods not to exceed forty years each with any or all of the Water Contractors requesting the same for water supplies within the delivery capabilities of the Agency's Transmission System, at a cost no greater than the Agency's Operation and Maintenance Costs and unreimbursed Capital Costs allocated on a proportionate use basis, it being understood that such renewal agreements shall provide for Entitlements and Entitlement Limits for each customer as set forth herein.

1.4 Previous Agreements Terminated or Modified

(a) The Eleventh Amended Agreement for Water Supply, dated January 26, 2001, between the Agency and the Water Contractors is terminated as of the effective date of this Agreement and superseded by this Agreement.

(b) Existing agreements between the Agency and Windsor are terminated and amended as follows, effective as of the effective date of this Agreement:

(1) All prior agreements between the Agency and Windsor for water deliveries from the Transmission System are terminated as of the effective date of this

Agreement, including the Application for Water Service, dated April 1, 1987. All water deliveries to Windsor from the Transmission System shall be made in accordance with this Agreement.

(2) The Agreement for the Sale of Water between the Sonoma County Water Agency and the Windsor Water District, dated June 8, 1991, is amended as follows:

(i) By deleting the text of Section 4 ("Shortage of Water and Apportionment") thereof and replacing it with the following: "In the event of a shortage in the quantity of water available to its customers, including the Town of Windsor, the Agency shall apportion water as provided in the Restructured Agreement for Water Supply, dated _____. In such event, (1) the Town of Windsor shall limit its total diversions and rediversions of water from the Russian River, including both diversion and rediversions pursuant to this agreement and all of its other diversions and rediversions, to the amounts of water that the Agency allocates to the Town of Windsor, and (2) in determining the amount of water available for allocation, the Agency shall include the amount of water available for diversion or rediversion by the Town of Windsor under its water rights in addition to the amount available to the Agency under its own water rights."

(ii) By adding at the end of Section 10 ("Payment") the following: "The Town of Windsor shall also pay any charges required by the Restructured Agreement for Water Supply, dated _____, including the charges required by Section 4.17(b) of that agreement."

1.5 Enforcement

The failure of any Water Contractor to perform its obligations hereunder shall not excuse the remaining Water Contractors from performing their obligations hereunder nor excuse the Agency from performing its obligations hereunder to said remaining Water Contractors. Each and all of the provisions of this Agreement shall be enforceable by action brought by any party hereto for specific performance or any other appropriate action at law for damages or in equity for other appropriate relief to the end that no party hereto shall suffer from the default of any other party. Nothing in this Agreement shall preclude any Water Contractor from seeking unilateral redress under the law from the Agency, or any other party, Customer, or entity. Any owner or holder

of Revenue Bonds may also enforce any provision of this Agreement inuring to the benefit of the holders of the Revenue Bonds.

1.6 Amendments

(a) Except as hereafter provided, this Agreement may be amended only with the consent of all the parties hereto.

(b) Any annual delivery limit contained in Section 3.1 may be modified by written Agreement between the Agency and the Water Contractor to which such annual delivery limit applies without the consent of the other parties to this Agreement for the purpose of conforming such annual delivery limits to a general plan which is applicable to the service area of such Water Contractor. Copies of any such written agreements shall be provided to all the parties to this Agreement.

(c) As of the effective date of this Agreement, Forestville is no longer a Water Contractor, and this Agreement may be amended without the consent of Forestville, provided, however, that Forestville's consent shall only be required for any amendment that impairs or affects any then-existing obligation of the Agency to supply water to Forestville from the Transmission System.

(d) If any amendment to this Agreement reduces the revenues to be received by the Agency or otherwise impairs the ability of the Agency to meet its Revenue Bond Obligations, then such amendment shall be effective only with the consent of the Trustee. The Trustee shall give such consent if the Trustee determines that, following such amendment, the Water Contractors will be obligated under this Agreement to make payments to the Agency sufficient to enable the Agency to pay principal of and interest on the Revenue Bonds and to meet all its other Revenue Bond Obligations. In making such determination, the Trustee may rely upon such certificates or opinions from qualified attorneys, engineers or accountants as the Trustee may deem necessary and obtain from the Agency.

1.7 Pledge of Revenues

Each party hereto acknowledges that anything herein to the contrary notwithstanding, all sums paid to the Agency pursuant to this Agreement are "Revenues of the Transmission System" of the Agency as defined in Ordinance No. 1, except (a) the payments and credits set forth in Section 4.4, (b) the payments of the Russian River Conservation Charge and the Russian River Projects Charge made

pursuant to Section 4.11 and 4.18, (c) the payments of the Water Management Planning Sub-Charge made pursuant to Section 4.13, (d) the payments of the Watershed Planning and Restoration Sub-Charge made pursuant to Section 4.14, (e) the payments of the Recycled Water and Local Supply Sub-Charge made pursuant to Section 4.15, and (f) the payments of the Water Conservation Sub-Charge made pursuant to Section 4.16, and are pledged to the payment of the Agency's Transmission System Revenue Bond Obligations. All said sums shall be received, allocated and paid out pursuant to and consistent with Ordinance No. 1 and other obligations and covenants of the Agency with respect to Revenue Bonds. All references in this Agreement to the accounting for, allocating, paying, and crediting of monies are subject to the priority established by Ordinance No. 1 on all such revenues.

The parties hereto recognize that the Revenue Bonds are to be paid from revenues, as provided herein, and that it is the intention of the parties that the charges set forth herein will be sufficient to pay the Revenue Bonds and to meet the Revenue Bond Obligations not met from other sources of funds. The Water Contractors, therefore, agree to pay promptly such charges notwithstanding any deficiency in the quantity or quality of water to which they or any of them would be entitled pursuant to this Agreement. The provisions of this Agreement are made for the benefit of the owners and holders from time to time of the Revenue Bonds and may be enforced by or on behalf of any such owner or holder.

1.8 Books, Records and Accounts

The Agency shall keep or cause to be kept, proper books, records and accounts in which complete and accurate entries shall be made of all monies received from all entities, including the Agency's Regular Customers, and of the basis for and application of said money, including detailed sub accounts showing expenditures made from Operation and Maintenance Charge revenues for Water Conservation Projects, Recycled Water Projects, Local Supply Projects, water management planning, and watershed planning and restoration. Said books, records and accounts will be available during normal business hours for inspection by the Water Contractors or their authorized representatives. The Agency will transmit to the Water Contractors two reports each year of the receipts and expenditures of the Transmission System. The first report will be issued no later than February 1 and shall be accompanied by a preliminary budget for the following Fiscal Year, and will show expenditures for the first half of the Fiscal Year together with estimated year-end expenditures and estimated expenditures for the following Fiscal Year. The second report will be issued after the end of each Fiscal Year and will contain a budgetary accounting of Transmission System expenditures,

revenues and balances for the Fiscal Year. Each month the Agency shall supply each Water Contractor with a summary showing the amount of water delivered during the preceding month to each Regular Customer and Surplus Customer.

1.9 Water Contractors' Duty to Provide Funds

Each Water Contractor shall use any and all means legally available to it (including, without limitation, the enactment and maintenance in effect of legislation establishing fees, tolls, rates and charges pertaining to the operation of its water distribution system) so as to produce monies sufficient in amount to meet the monetary obligations incurred by it pursuant to this Agreement and to enable it to maintain its water distribution system in good working order.

1.10 Severability

If any one or more sections, provisions, promises, or conditions of this Agreement is declared void or voidable for any reason by a final judgment or order of a court of competent jurisdiction, it is hereby declared to be the intention of each party and agreed that each and all of the other sections, provisions, promises and conditions of this Agreement shall be and remain in full force and effect.

1.11 Third Party Beneficiaries

Except for the holders of the Revenue Bonds, no third party beneficiaries are intended or established by this Agreement.

1.12 Water Conservation Requirements

(a) The Regular Customers of the Agency, and the Agency, shall (1) become members of the California Urban Water Conservation Council ("CUWCC") within six months of the effective date of this Agreement and remain as members in good standing; (2) sign the "Memorandum of Understanding Regarding Urban Water Conservation in California" ("MOU") maintained by the CUWCC and implement the Best Management Practices ("BMPs") of water conservation as are promulgated by CUWCC from time to time, or implement alternative water conservation measures that secure at least the same level of water savings, and shall complete and file the annual CUWCC report form; and (3) implement or use their best efforts to secure the implementation of any water conservation requirements that may be added as terms or conditions of the Agency's appropriative water rights permits or licenses, or with which the Agency must

comply under compulsion of regulation or law. In addition to and notwithstanding the foregoing, all Regular Customers of the Agency shall require metered billing of all customer accounts they serve.

(b) Should the Water Advisory Committee determine and so notify any Water Contractor that its efforts to achieve compliance with the water conservation practices required by this Section 1.12 are unsatisfactory, then such Water Contractor shall bring its water conservation program into compliance within six months after such notice, or within such additional time as may be granted by the Water Advisory Committee. Should such Water Contractor's noncompliance as determined by the Water Advisory Committee continue for six months after such notice of noncompliance, or beyond such additional time as may be granted by the Water Advisory Committee, then the Water Contractor shall thereafter pay a surcharge on all water delivered by the Agency pursuant to this Agreement equal to ten percent of the Operation and Maintenance Charge until the Water Advisory Committee determines that such Water Contractor is in compliance. The proceeds of any surcharge paid pursuant to this section shall be deposited and paid out in the same manner as the proceeds of the Water Conservation Fund.

(c) The Agency shall use its best efforts to modify its rules and regulations and existing contracts with Other Agency Customers to implement the water conservation requirements set forth in Section 1.12(a) and the default provisions set forth in Section 1.12(b). With respect to Russian River Customers, the Agency shall use its best efforts to encourage and, where and when possible, require said customers to sign the "MOU" maintained by the CUWCC and implement the "BMPs" of water conservation as are promulgated by CUWCC from time to time.

(d) Nothing in this section shall limit Regular Customers to implementing only those Water Conservation Projects contemplated by the CUWCC BMPs. Regular Customers are encouraged to implement Water Conservation Projects that go beyond the CUWCC BMPs.

1.13 Recycled Water and Local Supply Project Requirements

Within ten (10) years from the effective date of this Agreement, the Water Contractors shall use their best efforts to carry out or participate in Recycled Water or Local Supply Projects capable of delivering Recycled Water or potable water sufficient to reduce the Water Contractors' collective deliveries from the Transmission System (including, in the case of Windsor, reductions in withdrawals from Windsor's Russian

River wells), by at least 7,500 acre-feet per year, with approximately 50% of such reduction resulting from Recycled Water Projects.

1.14 Transitional Provisions Applicable to Forestville

As of the effective date of this Agreement, the Agency's right, title, and interest in facilities comprising the Forestville Aqueduct shall be transferred as follows:

(a) The existing Forestville pipeline from the Santa Rosa Aqueduct to Forestville and the storage building at the existing booster pumping plant shall be transferred to Forestville.

(b) The existing booster pumping plant and the existing 300,000-gallon reservoir shall become Storage Facilities.

(c) Subject to the limitation in subsection (d) of this section, the Agency shall provide funding to Forestville for the Capital Costs of an 8" pipeline to be constructed by Forestville from the Intertie Aqueduct at the extension of Templeman Road, west on Templeman Road to State Highway 116, then north on State Highway 116 West to Kay Lane. The pipeline shall be funded as a common facility. Forestville shall commence construction on the pipeline within five years of the effective date of this Agreement; provided, however, that if the commencement of construction is delayed due to the application to Forestville of any circumstance specified in the second paragraph of Section 2.2 of this Agreement, then the Agency's General Manager/Chief Engineer may authorize an extension of the commencement date.

(d) The Agency's funding obligation under this section shall be limited to $690,000, increased by the change in the ENR Construction Cost Index between the effective date of this Agreement and the date of commencement of construction of the pipeline.

1.15 Local Production Capacity Goal

In order to mitigate against drought, earthquakes, spills, temporary impairments, and other events impacting the quantity or quality of water available from the Transmission System, and other emergencies that can befall an urban water supply system, it is highly desirable that each Water Contractor achieve and maintain local water production capacity capable of satisfying approximately forty percent (40%) of the Water Contractor's average day of the maximum month demand.

PART 2 - PLANNING, FINANCING, ACQUISITION, CONSTRUCTION, OPERATION AND MAINTENANCE

2.1 Financing Additions to the Existing Transmission System

The Agency will, subject to all applicable limitations specified in this Agreement and all applicable legal and regulatory limitations, finance additions to the Transmission System with cash available pursuant to Sections 3.6, 4.2, 4.6, 4.7, 4.8, 4.12, payments made by Marin Municipal pursuant to Section 4.11, payments made by North Marin pursuant to Section 4.4 and 4.9, any state, federal, or other grants or loans which may become available, and, if the Agency decides to issue new series or issues of Revenue Bonds, proceeds from the sale of Revenue Bonds.

2.2 Scheduling of Additions and Replacements to the Existing Transmission System

Subject to the availability of sufficient cash or proceeds from the sale of Revenue Bonds (if the Agency decides to issue new series or issues of Revenue Bonds) and any state, federal, or other grants or loans which may become available, and subject to all applicable limitations specified in this Agreement, the Agency will (1) construct or acquire additions to the existing Transmission System sufficient to meet the delivery Entitlements set forth in Section 3.1 and 3.2 at such times as may be necessary to enable it to reliably deliver to each of the Water Contractors such Entitlements at the time that each contractor shall require the same and to make the deliveries authorized pursuant to Section 3.12; (2) construct additional Russian River water production facilities (up to a total capacity of 168.9 mgd) so that the total water production capacity available at all times is not less than the average daily delivery to the Regular Customers and Marin Municipal (excluding Surplus Water and water in excess of Entitlement Limits) during the month of highest historical use plus 20 mgd; (3) construct, acquire, or lease Emergency Wells with capacities which are from time to time determined by the Water Advisory Committee; (4) construct Additional Facilities (up to a total capacity of 174.3 million gallons) to the extent necessary to maintain a quantity of water in storage equal to 1.5 times the average daily delivery to the Regular Customers except North Marin during the month of highest historical use; and (5) replace existing facilities and construct Additional Facilities, related buildings and appurtenances as necessary to insure the reliable and efficient operation of the Transmission System and to insure that the quality of the water delivered complies with all applicable state and federal water quality requirements.

The time within which the Agency shall be obligated to construct such additions and replacements to the existing Transmission System shall be extended, however, as a result of any delays caused by fire, earthquake, other acts of God, acts of the public enemy, riots, insurrections, governmental regulations on the sale or transportation of materials or supplies, strikes affecting such construction or transportation of materials or supplies in connection therewith, any State or Federal environmental regulations or restrictions, shortages and/or delay in the obtaining of materials, shortages of or allocations of fuel and other sources of energy, litigation resulting in court orders restraining the construction of such additions and replacements, inability of Agency for any reason to deliver the Revenue Bonds or any series thereof, or any other causes beyond the control of Agency or any contractor constructing any part of such additions and replacements.

2.3 Further Modifications to Transmission System

(a) With the approval of the Water Advisory Committee and subject to the availability of sufficient funds, the Agency may undertake studies, and prepare technical reports, financial plans, and environmental documents for Transmission System facilities in addition to those authorized to be constructed by this Agreement. If such activities are undertaken pursuant to this paragraph, the cost thereof shall be considered to be costs of Common Facilities and shall be paid from funds available pursuant to subsection (c) of Section 4.2, or from the proceeds of Revenue Bonds and payments made by North Marin pursuant to Section 4.4. If the cost is paid from the proceeds of Revenue Bonds and payments made by North Marin, the cost shall be allocated as provided in subsection (b), paragraph 9 of Section 4.3 and Section 4.9.

(b) Except for the facilities described in Section 2.2, the Agency will not construct or acquire additions to the Transmission System that would increase the charges payable by, or diminish or impair the water available to, any of the Water Contractors except on such terms and conditions as may be agreed upon in writing by the Agency and each Water Contractor who would be required to make any additional payment by reason of such construction or whose water supply might be diminished or impaired by such construction. If such addition is a booster pump or any other device, method, or system that would enlarge or increase the capacity of any one customer to the detriment of other users, then such addition or alteration shall not be made by Agency except by amendment to this Agreement. If a question arises as to whether an addition or alteration to the Transmission System requires an amendment of this Agreement pursuant to this section, then such question shall be submitted to the Water Advisory Committee and its decision shall be conclusive.

2.4 Potter Valley Project

(a) All or part of the Potter Valley Project may be acquired upon a determination by the Board of Directors of the Agency that such acquisition is necessary to insure the Agency's continued ability to make the water deliveries authorized by this Agreement and maintain fisheries and other incidental benefits to the Russian River basin, provided, however, that no part nor all of the Potter Valley Project shall be acquired without the affirmative vote of at least six (6) representatives of the Water Contractors on the Water Advisory Committee representing at least two-thirds of the total weighted votes as calculated pursuant to Section 5.3(a). The Agency shall not be liable to any of its Customers for any damage resulting from any Agency decision regarding the acquisition or non-acquisition of any part or all of the Potter Valley Project.

(b) The Agency shall commence a process upon the effective date of this Agreement to evaluate the water supply and fisheries benefits provided by the Potter Valley Project within the Russian River watershed, the economic and operational feasibility of acquiring the Potter Valley Project, and whether alternative actions could reduce the need for the Agency to acquire the Potter Valley Project. Alternative actions to be evaluated may include the increased use of recycled water to reduce agricultural and other diversions from the Russian River and its tributaries; the modification of instream flow requirements in the Russian River; and the completion of state and/or federal recovery plans for salmonid species listed as threatened or endangered in the Russian River watershed. The cost of such evaluations shall be paid from Watershed Planning and Restoration Sub-Charge funds available pursuant to subsection 4.14; however, the Agency shall use its best efforts to obtain the agreement of other interested parties who divert water from the Russian River or its tributaries (including municipal and agricultural diverters) to pay for a portion of such costs and to participate in the implementation of such alternative actions. Before acquiring the Potter Valley Project, the Agency shall conduct an environmental analysis of the acquisition pursuant to CEQA, which analysis may include an evaluation of alternative flow regimes from the Potter Valley Project into the Russian River and the Eel River.

(c) Upon determination by Agency that alternative actions could reduce the need for the Agency to acquire the Potter Valley Project, the Agency and the Water Contractors shall engage in a cooperative process to implement said other actions.

2.5 Water Conservation Projects

Subject to the restrictions set forth in Section 4.16, the Agency may undertake or fund any cost-effective Water Conservation Project that has been approved by the Water Advisory Committee.

2.6 Recycled Water and Local Supply Projects

Subject to the approval of the Water Advisory Committee, the Agency may (a) construct, fund, or partially fund studies or investigations or the Capital Cost of local Recycled Water Projects and Local Supply Projects, or (b) enter into agreements for the acquisition and sale of Recycled Water (or the rights to Recycled Water). The Agency and the Water Contractors shall seek financial contributions for local Recycled Water and Local Supply Projects funded under this section from benefitted wastewater treatment plant owners, sanitation districts, and other benefitted parties. Projects constructed, funded, or partially funded by the Agency under this section shall not be part of the Transmission System, and the operation and maintenance cost of such projects shall be the responsibility of the Water Contractors or other parties carrying out, sponsoring, or participating in such projects. The benefits from any Recycled Water Project shall be apportioned equitably based upon the respective financial contributions to the Recycled Water Project by the parties funding such project. The Capital Costs (including Revenue Bond Obligations, if any) of Local Supply Projects or Recycled Water Projects or of acquiring Recycled Water or the rights thereto shall be paid or partially paid from the Recycled Water and Local Supply Fund.

2.7 Water Management Planning

The Agency shall periodically prepare a draft regional Urban Water Management Plan pursuant to the Water Code for consideration by the Water Contractors. Each Water Contractor shall provide the Agency with all information and data the Agency reasonably determines to be necessary to allow the Agency to prepare the draft regional Urban Water Management Plan. The Agency shall use its best efforts to prepare a draft regional Urban Water Management Plan that meets the requirements of the Water Code. Each Water Contractor shall either adopt the draft regional Urban Water Management Plan prepared by the Agency as its Urban Water Management Plan, or prepare and adopt its own Urban Water Management Plan pursuant to the Water Code. Before adopting the Urban Water Management Plan prepared by the Agency, a Water Contractor shall evaluate the Plan, and adoption of the Plan by a Water

Contractor shall constitute a determination by that Water Contractor that the Plan meets the requirements of the Water Code as to that Water Contractor.

2.8 Watershed Planning and Restoration

(a) The Agency may undertake any action, study, or project approved by the Water Advisory Committee related to (1) the development or implementation of watershed restoration and maintenance plans and projects (including, but not limited to, stream restoration projects, water quality monitoring studies and projects, public education and outreach activities, and funding of third-party studies and projects) or (2) groundwater studies and investigations. Before undertaking any such action, study or project: (1) the Agency shall consider suggestions received from the public, Water Contractors, and interested parties and organizations such as the Russian River Watershed Association as to the actions, studies, and projects to be undertaken by the Agency hereunder; and (2) the Agency and the Water Contractors shall identify and use their best efforts to obtain funding contributions from other parties that would benefit from the actions, studies, or projects authorized hereunder, including but not limited to federal and state loans and grants, municipalities (including Russian River Customers, county and special district governments), and urban and industrial development, gravel mining, agriculture, forest harvesting, recreation, and sport and commercial fishing interests.

(b) The authority granted to the Agency under this Section 2.8 is permissive and not mandatory, and that nothing in this Section 2.8 shall (1) require the Agency to undertake any action or project unless such action or project is approved by the Agency, (2) impair or affect the Agency's right to undertake any action or project not funded under this Agreement, or (3) require the Agency to engage in any regulatory activity.

(c) The Agency may carry out projects and activities within the scope of subsection (a) above that primarily or exclusively benefit one or more Water Contractors, provided (1) each such project and activity is approved by the Water Advisory Committee and the benefitted Water Contractors, and (2) some or all benefitted Water Contractors enter into an agreement with the Agency for such project or activity and agree to pay supplemental charges as approved by the Agency and the Water Advisory Committee to defray all or a portion of the cost of the project or activities.

2.9 Planning Coordination

(a) The parties to this Agreement shall consult with agencies that have planning and zoning powers within their water service territories in the manner set forth in California Government Code Section 65352.5 in order to promote close coordination and consultation between water supply agencies and land use approval agencies to ensure that proper water supply planning occurs in order to accommodate projects that will result in increased demands on water supplies.

(b) The parties to this Agreement shall consult with agencies that have building regulatory powers pursuant to the Government Code and Health and Safety Code to promote use of water conservation equipment, fixtures, appliances, devices and techniques.

2.10 Operation and Maintenance

The Agency shall operate and maintain the Transmission System in a good state of repair.

PART 3 - WATER SUPPLY

3.1 Delivery Entitlements of Water Contractors

Subject to Section 3.5, the Agency shall deliver to each Water Contractor at the points of delivery hereinafter set forth such quantities of water as the Water Contractor shall from time to time require at such rates of flow as are necessary to meet its peak day's demand, subject to the following:

(a) The Agency shall not be obligated to deliver water in excess of the following:

Water Contractor/Aqueduct	Average Daily Rate of Flow During Any Month	Annual Amount During Fiscal Year (excluding Surplus Water)
Santa Rosa		
From Reach 1, 2, and 3a of the Intertie Aqueduct	40.0 mgd	
From the Santa Rosa Aqueduct	40.0 mgd	
From the Sonoma Aqueduct	4.0 mgd	
Maximum combined total from all aqueducts	56.6 mgd	29,100 AF
North Marin		
From Petaluma Aqueduct	19.9 mgd	14,100 AF
Petaluma		
From Petaluma Aqueduct	21.8 mgd	13,400 AF
Rohnert Park		
From Petaluma Aqueduct or Reach 3 of Intertie Aqueduct	15.0 mgd	7,500 AF

Valley of the Moon		
From Sonoma Aqueduct	8.5 mgd	3,200 AF
Sonoma		
From Sonoma Aqueduct	6.3 mgd	3,000 AF
Cotati		
From Petaluma Aqueduct or Reach 3 of Intertie Aqueduct	3.8 mgd	1,520 AF
Windsor		
From Santa Rosa Aqueduct	1.5 mgd	900 AF
From Russian River Diversions	7.2 mgd	4,725 AF

The delivery limits for Windsor include both water delivered by the Agency through the Transmission System and water diverted by Windsor through facilities owned by Windsor under its own water rights and under the Agency's water rights pursuant to the agreement between the Agency and Windsor dated January 8, 1991. Windsor shall not divert any water under the Agency's water rights through its own facilities except and to the extent that water is unavailable for diversion under any of Windsor's available water rights, as such rights currently exist or may exist in the future. Windsor shall act with diligence to take all actions necessary to obtain and retain any water rights to which Windsor may be entitled. For purposes of allocations pursuant to Section 3.5(a), (1) Windsor shall be considered to be a "Russian River Customer" with respect to its direct Russian River diversions, and (2) in determining the amount of water available for allocation under Section 3.5(a), the Agency shall include the amount of water available for diversion by Windsor under Windsor's water rights in addition to the amount available to the Agency under its own water rights. For purposes of allocations pursuant to Section 3.5(b), Windsor's average daily rate of flow during any month Entitlement Limit shall be 1.5 mgd.

(b) North Marin shall not take delivery of water at an instantaneous delivery rate greater than its average delivery rate for such day, if such instantaneous delivery rate would increase the Agency's cost of electrical energy. North Marin shall not take delivery of water at a rate of more than 19.9 mgd during more than 14 days of any month, nor at a rate of more than 20.9 mgd during any day of any month. Irrespective of its delivery Entitlement, North Marin shall nevertheless have the right to a flow rate of 14.8 mgd in the Petaluma Aqueduct.

(c) No Water Contractor shall take delivery of water at an average rate during any month that is greater than 2.0 times the average rate of delivery to that contractor during the preceding 12 months. The Agency also shall adopt this requirement as a service rule applicable to Other Agency Customers. However, if any Regular Customer was during the preceding 12 months subject to a curtailment in deliveries pursuant to Section 3.5, then the limit prescribed by this subsection shall be 2.0 times the average rate of delivery that such customer would have received in the absence of such curtailment. This rule shall not apply to Water Contractors who utilize local sources of supply to reduce demand on the Transmission System during the peak summer period of June 1 through September 30, and whose average production rate for said period from all of the contractor's local sources is equal to at least 2.0 times the average production rate of all of that contractor's local sources during the eight months immediately preceding the peak summer period.

(d) No Water Contractor shall take delivery of water during any month at an average rate that is greater than 1.3 times the average rate of delivery to that contractor during the peak month of the prior three calendar years without the written consent of the Agency. The Agency also shall adopt this requirement as a service rule applicable to Other Agency Customers. Such consent shall be given by the Agency if and only if sufficient transmission capacity exists to make such increased deliveries and the deliveries to the other Water Contractors required to be made pursuant to this section. However, if any Water Contractor was during the preceding three calendar years subject to a curtailment in deliveries pursuant to Section 3.5, then the limit prescribed by this subsection shall be 1.3 times the average rate of delivery that such contractor would have received during the peak month of the prior three calendar years in the absence of such curtailment.

(e) For purposes of determining Santa Rosa's average daily rate of flow during any month Entitlement Limit under this subsection, all water delivered to Santa Rosa from the Kawana Pipeline or from the pipeline connecting the Kawana Springs and Ralphine reservoirs shall be deemed delivered from Reach 3a of the Intertie Aqueduct.

3.2 Conditions on Other Agency Customer Deliveries

The Agency may furnish water from the Transmission System to Other Agency Customers subject, however, to the following conditions:

(a) The total quantity of water delivered to all the Other Agency Customers shall not exceed an average of 2.7 million gallons per day during any month.

(b) The Agency shall not enter into contracts to furnish water to any Other Agency Customer except itself or the County of Sonoma for use on land within two miles of the Corporate Territory of a Water Contractor or Forestville except with the prior written consent of such Water Contractor or Forestville, which consent will be subject to the condition that the Agency shall cease delivering water to such customer whenever a Water Contractor or Forestville is willing and able to furnish water to such customer. Water delivered by the Agency from the Transmission System to the Agency or the County of Sonoma shall not be used for residential, commercial, or private industrial purposes.

(c) The Agency shall not deliver more than an average of 0.5 million gallons per day during any month from the south part of the Petaluma Aqueduct to Other Agency Customers.

(d) The Agency shall not deliver more than an average of 1.5 million gallons per day during any month from Reach 1 of the Intertie Aqueduct to Forestville.

(e) The Agency shall not sell water from the Transmission System except as expressly authorized by this Agreement.

3.3 Deliveries in Excess of Entitlement Limits

(a) No Regular Customer may take delivery of water in excess of its average daily rate of flow during any month Entitlement Limit as set forth in Sections 3.1 or 3.2, except upon the following conditions:

first, that such excess delivery does not impair or delay the delivery to any other Regular Customer of its Entitlements; and

second, that the Regular Customer taking the excess delivery is then proceeding in good faith, with plans and funding to develop a reliable water supply, sufficient to supply its needs in excess of its Entitlement Limits; and

third, that either

(1) all the Water Contractors approve such excess delivery; or

(2) such excess delivery is made during a period when deliveries to another Water Contractor are less than its Entitlement Limits, such excess delivery does not exceed the unused amounts of said contractor's Entitlement Limits, and said contractor has notified the Agency in writing of its consent to said delivery.

(b) Any Water Contractor may transfer any portion of its annual amount during any fiscal year Entitlement Limit to any other Water Contractor for such periods of time and pursuant to such terms as agreed to by the transferor Water Contractor and the transferee Water Contractor, subject to the following:

(1) Such transfer shall not impair or delay the delivery to any other Regular Customer of its Entitlements.

(2) Notice of a proposed transfer, including adequate information to identify any impacts to deliveries of water to other Water Contractors, shall be provided to all the other Water Contractors individually, to the Water Advisory Committee, and to the Agency. Upon request of any other Water Contractor, the transferor and transferee Water Contractors shall promptly meet to identify and resolve any potential impacts of the proposed transfer. If any Water Contractor determines that the proposed transfer will impair or delay the delivery of its Entitlements, such Water Contractor may file a written objection to the proposed transfer with the Water Advisory Committee, with a copy to the Agency. Such objection must be filed no later than 45 days after the Water Contractor receives notice of the proposed transfer. Thereafter, the Water Advisory Committee shall determine whether the proposed transfer will impair or delay the delivery of the objecting Water Contractor's Entitlements, and whether there are measures that will eliminate such impairment or delay. In the absence of an objection to a proposed transfer by any Water Contractor, the approval of the Water Advisory Committee is not required.

(3) The average daily rate of flow during any month Entitlement Limit of the transferee Water Contractor as set forth in Sections 3.1 or 3.2 and the other delivery limitations applicable to the transferee Water Contractor shall not be affected by, and shall remain applicable notwithstanding, any transfer under this subsection.

(4) Payments to the Agency for delivery of the transferred water to the transferee Water Contractor shall be based upon the Aqueduct rate applicable to the transferee Water Contractor pursuant to this Agreement.

(5) The transferor and transferee Water Contractors shall be responsible for all regulatory compliance relating to the transfer, including compliance with the provisions of the California Environmental Quality Act. To the greatest extent permitted by law, the transferor and transferee Water Contractors shall indemnify and defend each of the other Water Contractors and the Agency from any claims, damages, or judicial or administrative proceedings arising out of any actions related to this Subsection 3.3(b), whether or not there is concurrent negligence on the part of the other Water Contractors or the Agency or each of them, but excluding liability due to the sole active negligence or willful misconduct of any of the other Water Contractors, the Agency, or each of them. The latter exclusion shall operate only as to the particular Water Contractor or Agency whose sole active negligence or willful misconduct caused the exclusion.

3.4 Surplus Water

(a) Surplus Water is water that from time to time may be available for delivery from the Transmission System in excess of the amounts required to meet the Agency's contractual obligations and the requirements of all the Agency's Regular Customers for uses other than those described in subdivision (b) of this section.

(b) Surplus Water may be used only for the following purposes:

(1) replenishment of surface water supply reservoirs or recreational lakes, including but not limited to Ralphine, Spring, and Stafford Lakes, or

(2) replenishment of groundwater basins;

provided, however, that Surplus Water also may be provided for use for irrigation of land used for commercial production of food or fiber if such provision of water is required by any agreement in existence on the effective date of this Agreement.

(c) The Agency shall deliver Surplus Water only from separate metered turnouts on the Transmission System or the North Marin Aqueduct.

(d) The Water Contractors shall have first priority on deliveries of Surplus Water.

(e) The Agency desires to transfer all of its Surplus Customers to the Water Contractors. The parties to this Agreement shall cooperate in the voluntary permanent transfer of Surplus Customers from the Agency to the party whose corporate territory encompasses the site of a given Surplus Customer or whose corporate territory boundary is within two miles of the turnout(s) serving said customer. Should a given Surplus Customer lie within two miles of more than one party, the parties shall meet and confer with the Agency and by mutual agreement determine who is best suited to take over said Surplus Customer. Nothing in this subsection shall require a Water Contractor to take over service of any Agency Surplus Customer. Should a given party opt not to take over Surplus Customers who lie within their corporate territory or within two miles of the boundary of same, then any other party to this Agreement whose corporate territory lies within Sonoma County may apply to the Agency to take over said Surplus Customers. Parties who agree to take on such service shall be known as Surplus Water providers.

(f) Surplus Water providers agree to interrupt delivery of Surplus Water upon notification by Agency if Agency determines, in its sole discretion, that there exists an immediate or pending problem involving loss of Transmission System storage, inadequate pumping capacity, a valid complaint from any Regular Customer that they are not receiving their appropriate Entitlement as a result of Surplus Water deliveries, or any other problem impacting the delivery capability of the Transmission System. Surplus Water providers shall notify their customers of Agency's right to require such delivery interruptions. Notwithstanding the right of the Agency to notify and cause the interruption of delivery of Surplus Water, a Surplus Water provider may also interrupt delivery of Surplus Water at any time it determines it is necessary or prudent to do so in order to satisfy the demands of its non-Surplus Customers; or for water system maintenance, repair, or planned or unplanned outage of any nature whatsoever, including but not limited to a perceived, threatened or actual water shortage. Deliveries of Surplus Water shall not be deemed to be included as part of any Regular Customer's Entitlement or Entitlement Limit.

3.5 Shortage of Water and Apportionment

(a) (1) The Agency shall use its best efforts to obtain, perfect, and maintain appropriative water rights in amounts sufficient to be able to make the water deliveries provided for in this Agreement. In its operation of the Russian River Project, the Agency shall use all reasonable means to prevent a deficiency in the

quantity of water that is available to the Agency for diversion and rediversion under the Agency's water rights. However, nothing in the preceding two sentences shall be construed to limit the Agency's discretion to take appropriate actions in good faith to resolve any issue that may arise under the federal Endangered Species Act or any other federal or state law affecting the Agency's water rights or operation of the Russian River Project.

(2) If by reason of drought, environmental laws or regulations, other causes beyond the control of the Agency, or any change in the amounts of water imported by the Potter Valley Project into the Russian River watershed (whether or not such change is caused by any action or inaction of the Agency) a deficiency does occur, the Agency shall not be liable to any of its customers for any damage arising therefrom.

(3) In the event of a deficiency pursuant to subsection 3.5(a)(2), the Agency first shall cease all deliveries of Surplus Water to other than the Water Contractors; second, shall cease deliveries of all Surplus Water; third, shall cease deliveries to Regular Customers in excess of their respective annual Entitlement Limits; and fourth, shall apportion the available supply of water as follows:

> (i) first, deliver to each of its Regular Customers, not in excess of their respective Entitlement Limits, authorize Agency's Russian River Customers to divert or redivert not in excess of the amounts for which those customers have contracted to purchase from the Agency, and deliver to Marin Municipal not in excess of the amounts, if any, that are required to be delivered pursuant to the Third Amended Offpeak Water Supply Agreement dated January 25, 1996, the Amended Agreement for the Sale of Water between the Sonoma County Water Agency and the Marin Municipal Water District dated January 25, 1996, amendments to these agreements that have been approved by the Water Advisory Committee, or subsequent agreements between the Agency and Marin Municipal that have been approved by the Water Advisory Committee, the quantities of water required by each such customer for human consumption, sanitation, and fire protection as determined by the Agency after taking into consideration all other sources of potable water then available to said customer, including, for Russian River Customers, water available under their own water rights;

(ii) second, to the extent additional water is available to the Agency, allocate that water proportionately as follows: deliver such water to Agency's Regular Customers based upon their respective average daily rate of flow during any month Entitlement Limits, authorize the Agency's Russian River Customers to divert or redivert such water based upon the delivery limits set forth in the agreements between the Agency and its Russian River Customers, and deliver such water to Marin Municipal pursuant to and to the extent required by the Third Amended Offpeak Water Supply Agreement dated January 25, 1996, the Amended Agreement for the sale of Water between the Sonoma County Water Agency and the Marin Municipal Water District dated January 25, 1996, amendments to these agreements that have been approved by the Water Advisory Committee, or subsequent agreements between the Agency and Marin Municipal that have been approved by the Water Advisory Committee;

(iii) provided, however, that no Customer shall receive under subsections 3.5(a)(3)(i) and 3.5 (a)(3)(ii) a total quantity of water in excess of its reasonable requirements or its said Entitlement Limits or contracted amount, whichever is less.

(b) (1) In the event of a temporary impairment of the capacity of the Transmission System by reason of natural disaster, sabotage or other causes beyond the control of the Agency, the Agency shall not be liable to any of its customers for any damage arising therefrom.

(2) In the event of a Section 3.5(b)(1) impairment, the Agency shall:

(i) first, deliver to each of its Regular Customers the quantity of water, not in excess of the respective average daily rate of flow during any month Entitlement Limit, required by it for human consumption, sanitation, and fire protection as determined by the Agency after taking into consideration all other sources of potable water then available to said customer;

(ii) second, to the extent additional Transmission System capacity is available to the Agency, deliver a quantity of water to the Regular Customers in proportion to their respective average daily rate of flow during any month Entitlement Limits, provided, however, that no Regular

Customer shall receive under subsections 3.5 (b)(2)(i) and (b)(2)(ii) a total quantity of water in excess of its reasonable requirements or its average daily rate of flow Entitlement Limit, whichever is less;

(iii) third, to the extent additional Transmission System capacity is available, deliver water to Regular Customers in excess of their average daily rate of flow Entitlement Limits pursuant to Section 3.3;

(iv) fourth, to the extent additional Transmission System capacity is available, deliver water to Marin Municipal not in excess of the delivery limitations in Section 3.12;

(v) fifth, to the extent additional Transmission System capacity is available, deliver Surplus Water to the Water Contractors;

(vi) sixth, to the extent additional Transmission System capacity is available, deliver Surplus Water to other than the Water Contractors.

(3) However, deliveries to Marin Municipal shall not be reduced or curtailed under this Section 3.5(b) because of inadequate capacity in the new aqueduct to be constructed generally paralleling the portion of the Petaluma Aqueduct that extends from the Ely Pumping Plant to Kastania Reservoir, if such new aqueduct is paid for and dedicated to the Agency pursuant to Section 13 of the Amended Agreement for the Sale of Water between the Sonoma County Water Agency and the Marin Municipal Water District dated January 25, 1996.

(c) (1) In determining "human consumption, sanitation, and fire protection" amounts pursuant to this Section 3.5, the Agency shall take into account the level of water conservation achieved by the Customer and the resulting decrease in end user ability to reduce water use (the hardening of demand) resulting from such conservation. The allocations pursuant to subsection 3.5(a)(3)(i) shall be determined using a methodology which rewards and encourages water conservation; avoids cutbacks based upon a percentage of historic consumption, and, among other things, bases the amounts necessary for "human consumption, sanitation, and fire protection" upon no greater than average indoor per capita water use determined from recent retail billing records for winter water use by all of the Water Contractors; and, if necessary or appropriate for equitable purposes, considers commercial, industrial and institutional water uses separately and determines that element of the subsection 3.5(a)(3)(i) allocation

based on winter water use from recent retail billing records for commercial, industrial, and institutional uses.

(2) The fundamental purpose of the "reasonable requirements" limitation is to ensure that no Customer receives more water during a shortage than that Customer reasonably needs. In determining "reasonable requirements" pursuant to this Section 3.5, the Agency may take into account the hardening of demand resulting from the level of conservation achieved by the Customer; the extent to which the Customer has developed Recycled Water Projects and Local Supply Projects; and the extent to which the Customer has implemented water conservation programs (including conservation required pursuant to the provisions of Section 1.12 of this Agreement). It is the intention of the parties to this Agreement that the Agency make its "reasonable requirements" determinations so as to encourage Customers to implement water conservation, Recycled Water, and Local Supply Projects.

(d) The Agency shall at all times have an adopted water shortage allocation methodology sufficient to inform each Customer of the water that would be available to it pursuant to Section 3.5(a) in the event of reasonably anticipated shortages, which methodology shall be consistent with this Section 3.5 and shall be included in the Urban Water Management Plan prepared pursuant to Section 2.7.

(e) The parties agree that it is extremely difficult and impractical to determine the damage caused to the Agency or other Customers as a result of the taking of water by any Customers in excess of the limitations contained in this Section 3.5. If any Customer takes delivery of water from the Transmission System or otherwise from the Russian River system in violation of this Section 3.5, then it shall pay the Agency, in addition to all other applicable charges, liquidated damages in an amount equal to 50 percent of the applicable Operation and Maintenance Charge (including all sub-charges) times the amount of water taken in violation of the provisions of this Section 3.5. The Agency shall use its best efforts to incorporate this liquidated damages provision into its agreements with Other Agency Customers, Russian River Customers, Marin Municipal Water District, and into the Agency's rules and regulations for the provision of water service, and impose liquidated damages pursuant to this Section 3.5(e). The existence of this liquidated damage provision shall not limit or restrict the Agency from physically limiting the quantity of water taken to the amounts authorized by this Section 3.5 or from pursuing all other available legal and equitable remedies applicable to such violations. By affirmative vote, the Water Advisory Committee may request that the Agency physically limit the quantity of water taken by a Regular

Customer to the amounts authorized by this Section 3.5 or that the Agency pursue all other available legal and equitable remedies applicable to such violations. The proceeds of any liquidated damages assessed pursuant to this subsection shall be deposited and paid out in the same manner as the proceeds of the Operation and Maintenance Charge.

(f) Notwithstanding subsections (a) and (b) above, as an alternative method for allocation under this Section 3.5 during a period of water deficiency or temporary Transmission System impairment, the Water Advisory Committee (or, in the event of a Transmission System temporary impairment affecting fewer than all of the Water Contractors, the Water Advisory Committee representatives of the Water Contractors affected by the temporary impairment) may, by unanimous vote, determine how water shall be allocated among the affected Water Contractors. The Agency shall provide a calculation methodology or other information adequate to enable the determination, in a manner consistent with this Section 3.5, of the volume of water to which (i) the Water Contractors as a group, and (ii) all other Customers would be respectively entitled. Any alternative method for allocation determined by the Water Advisory Committee pursuant to this subsection shall apply only to the volume of water to which the Water Contractors are entitled as a group.

(g) In the event that Transmission System capacity is expanded by the construction of facilities other than those authorized by this Agreement, then notwithstanding anything in this Section 3.5 to the contrary, any allocations made pursuant to this section to Forestville that are based upon the average daily rate of flow during any month Entitlement Limits shall not use a denominator greater than 133.4 mgd.

3.6 Fire Fighting Service

Anything herein to the contrary notwithstanding, the Agency may furnish water for fire fighting from hydrants or standpipes on the Transmission System, provided, however, that such service within two miles of the Corporate Territory of a Water Contractor may be furnished only if and during the period of time said Water Contractor consents thereto in writing. The Agency shall set fees sufficient to recover the full cost of installing and maintaining and supplying water to fire hydrants. All revenue from such fees shall be treated the same as money received from the Operation and Maintenance Charge and shall be deposited and paid out as set forth in Section 1.7 and subdivision (b) of Section 4.1. Agency shall adopt service rules limiting hydrant water usage to fire suppression, fire training and limited temporary uses such as providing metered construction water.

3.7 Quality of Water

(a) The Agency warrants that it will use its best efforts to insure that all water delivered hereunder shall be of such purity and quality required to meet minimum standards for human domestic consumption from time to time established by the state and federal governments. The Agency shall not be liable to any of its Customers for any damage arising from the quality of water that it delivers under this Agreement, except for damages based on any breach of the warranty described in the preceding sentence.

(b) The payment obligations of the Water Contractors set forth in Part 4 shall not be affected in any manner by the quality of the water delivered by the Agency hereunder.

3.8 Points of Delivery

All water furnished to each Water Contractor hereunder shall be delivered at the discharge flange of meters at turnouts owned and maintained by the Agency. Turnouts in addition to those now existing shall be constructed from time to time at such locations as shall be agreed upon by the Agency and the Water Contractors involved. Water delivered to Petaluma and North Marin at the McNear meter station shall be delivered at a hydraulic gradient of not less than 175 feet mean sea level. Turnouts installed for Regular Customers shall be not less than 8 inches in diameter. Turnout installation charges shall be determined from time to time by resolution of the Board of Directors of the Agency and shall be payable by the Customer prior to turnout installation by Agency.

3.9 Risk of Loss and Responsibility

Title and risk of loss with respect to all water delivered hereunder shall pass from the Agency to the Water Contractor at the point of delivery thereof as set forth in Section 3.8. The Agency shall not be responsible for the control, transmission, distribution, handling or use of water beyond the point of delivery thereof. Each Water Contractor shall be responsible for installing and maintaining any device it deems necessary to reduce or regulate the pressure under which the water may be delivered hereunder.

3.10 Place of Use of Water Delivered to North Marin

(a) North Marin may exchange water delivered under this Agreement for an equal amount of water delivered to it by Marin Municipal.

(b) Except as provided in subdivision (a) of this section, North Marin shall not permit any water delivered under this Agreement to be used outside of its own distribution system service areas.

3.11 Measurement

All water delivered by the Agency from the Transmission System shall be measured by meters installed and maintained by the Agency. The Agency shall test the accuracy of each meter not less frequently than annually and provide each Water Contractor with a report of such test. Each Water Contractor shall have the right at any time and at its expense to make additional tests of any meter. If a meter is found to be reading 2 percent or more fast or slow, it shall immediately be repaired to bring it within 2 percent accuracy or be replaced by the Agency.

3.12 Marin Municipal Water Deliveries

The Agency, pursuant to the Third Amended Offpeak Water Supply Agreement dated January 25, 1996 and the Amended Agreement For The Sale Of Water Between The Sonoma County Water Agency and the Marin Municipal Water District dated January 25, 1996, amendments to these agreements that have been approved by the Water Advisory Committee, or subsequent agreements between the Agency and Marin Municipal that have been approved by the Water Advisory Committee, may deliver water to Marin Municipal when and to the extent that the Transmission System has capacity in excess of that required by Agency to supply its Regular Customers the Entitlements set forth in Sections 3.1 and 3.2. However, deliveries to Marin Municipal shall not be reduced or curtailed because of inadequate capacity in the new aqueduct to be constructed generally paralleling the portion of the Petaluma Aqueduct that extends from the Ely Pumping Plant to Kastania Reservoir, if such new aqueduct is paid for by Marin Municipal and dedicated to the Agency pursuant to Section 13 of the Amended Agreement for the Sale of Water between the Sonoma County Water Agency and the Marin Municipal Water District dated January 25, 1996.

The maximum delivery rate to Marin Municipal between May 1 and October 31 shall not exceed 12.8 mgd. The total quantity of water delivered to Marin Municipal in any Fiscal Year shall not exceed 14,300 Acre Feet. Deliveries of water to Marin Municipal shall be made either through a separately metered turnout or through North Marin's metered turnout(s). If water is delivered through North Marin's metered turnout(s), then North Marin shall maintain in good repair and calibration metered turnouts at points of delivery from its system into Marin Municipal's system and shall

read such meters on or about the end of each month and provide to Agency an accounting of water delivered during the preceding month to Marin Municipal. In making such accounting, North Marin shall deduct from the total of water delivered to Marin Municipal any exchange water as provided in Section 3.10 of this Agreement and any water produced by North Marin and delivered to Marin Municipal.

3.13 Damages for Peaking on the Transmission System or Taking Water in Excess of Average Daily Rate of Flow Entitlement Limits in Violation of Section 3.3

The parties to this Agreement recognize that the Agency will have increased costs, in amounts that will be difficult to determine, if any Regular Customer takes water in violation of subsection (b), (c) or (d) of Section 3.1 or subsection (a) of Section 3.3. Accordingly, if any Regular Customer takes delivery of water from the Transmission System in violation of subsection (b), (c) or (d) of Section 3.1 or subsection (a) of Section 3.3, then it shall pay the Agency, in addition to all other applicable charges, liquidated damages in an amount equal to twenty-five percent (25%) of the applicable Operation and Maintenance Charge (including all sub-charges) times the amount of water taken in violation of these provisions. The assessment of liquidated damages pursuant to this section for a violation by a Regular Customer of subsection (b), (c) or (d) of Section 3.1 or subsection (a) of Section 3.1 may be waived by the Agency upon a showing by the contractor that the taking of delivery of water in violation thereof resulted from an act of God or other unforeseeable circumstances over which the Regular Customer had no control. The existence of this liquidated-damage provision shall not limit or restrict the Agency from physically limiting the quantity of water taken to the amounts authorized by this Agreement or from pursuing all other available legal and equitable remedies applicable to such violations. The proceeds of any liquidated damages assessed pursuant to this subsection shall be deposited and paid out in the same manner as the proceeds of the Operation and Maintenance Charge.

PART 4 - CHARGES AND PAYMENTS

4.1 Separate Charges and Funds

(a) On or before April 30 preceding each Fiscal Year during which any of the following charges are payable, the Agency will establish the amount of the following charges for the ensuing Fiscal Year:

(1) the Operation and Maintenance Charge, including
    (a) the Water Management Planning Sub-Charge,
    (b) the Watershed Planning and Restoration Sub-Charge,
    (c) the Recycled Water and Local Supply Sub-Charge,
    (d) the Water Conservation Sub-Charge,
(2) the Aqueduct Facilities Capital Charges, including
    (a) the Santa Rosa Aqueduct Capital Sub-Charge,
    (b) the Sonoma Aqueduct Capital Sub-Charge,
    (c) the Petaluma Aqueduct Capital Sub-Charge,
(3) the Storage Facilities Capital Charge,
(4) the Common Facilities Capital Charge, and
(5) the North Marin Capital Charge.

In determining the amount of these charges, the Agency shall include a reasonable allowance for usual contingencies and errors in estimation, and to maintain a prudent reserve in an amount determined from time to time by the Water Advisory Committee.

(b) All monies received in payment of said charges shall be received, allocated, and paid out consistent with the obligations and covenants of the Agency with respect to Revenue Bonds.

(c) In establishing each of said charges, the Agency shall assume that the quantity of water (other than Surplus Water) to be delivered from each aqueduct of the Transmission System shall be the same as the amount of water delivered from said aqueduct during the twelve months preceding such establishment, or the average annual amount of water delivered during the preceding 36 months, whichever is less.

If because of drought or other water-supply reduction, state or federal order, or other similar condition, the Agency anticipates that any such quantities will not be predictive of future usage, the Agency may use a different amount with the prior approval of the Water Advisory Committee.

4.2 Operation and Maintenance Charge

(a) The Operation and Maintenance Charge shall be a uniform annual charge per acre foot and shall be paid by all Regular Customers for all water delivered from the Transmission System.

(b) The aggregate amount of money to be received by the Agency from the Operation and Maintenance Charge for each Fiscal Year shall be sufficient to produce water sale revenues to cover the Agency's estimate of its Operation and Maintenance Costs for such Fiscal Year, to produce water sale revenues as required by Sections 4.13, 4.14, 4.15, and 4.16, and to produce additional revenues in amounts determined from time to time by the Water Advisory Committee to pay the Capital Costs of Common Facilities and Storage Facilities pursuant to subdivision (c) of this section.

(c) All money received by the Agency in payment of the Operation and Maintenance Charge shall be deposited and paid out as set forth in Section 1.7, and subdivision (b) of Section 4.1. After making the payments required by Section 1.7, remaining money received from the Operation and Maintenance Charge may be used to pay the Agency's operation and maintenance expenses, to make the deposits required by Sections 4.13, 4.14(g), 4.15, and 4.16(a), and to fund a prudent reserve for those expenses. Money received from the Operation and Maintenance Charge in excess of that necessary for operation and maintenance expenses, to make the deposits required by Sections 4.13, 4.14(g), 4.15, and 4.16(a), and to maintain a prudent reserve may from time to time be disbursed as provided in Section 4.5 to pay Capital Costs of Common Facilities and Storage Facilities. If money received from the Operation and Maintenance Charge is appropriated for expenditure for Storage Facilities, the funds shall be transferred to the Storage Facilities capital fund referred to in subsection (c) of Section 4.7. At the time of the transfer, an amount shall also be transferred to North Marin's account established pursuant to subsection (c) of Section 4.4, which amount shall bear the same proportion to the amount transferred to the Storage Facilities capital fund that the total amount payable by North Marin for the Operation and Maintenance Charge, exclusive of sub-charges, in the prior Fiscal Year bears to the total operation and maintenance revenue, exclusive of revenue from sub-charges, received by the Agency from sources other than North Marin during the prior Fiscal Year.

4.3 Allocation of Capital Costs to North Marin

(a) The Capital Costs of Remaining Facilities shall be allocated to North Marin in proportion to the following ratios:

	Facility	Ratio
1.	Storage Facilities	-0-
2.	Common Facilities	11.2/90.4

(b) The portions of the Capital Costs of the Additional Facilities, replacement facilities, and the Potter Valley Project, or the portion thereof that is to be acquired pursuant to Section 2.4 hereof, shall be allocated to North Marin are as follows:

Facility	Ratio
1. 2nd pipeline, generally paralleling Intertie Aqueduct Reach 1	8.7/55.8
2. 2nd pipeline, generally paralleling Intertie Aqueduct Reach 2	8.7/55.8
3. 2nd pipeline, generally paralleling Intertie Aqueduct Reach 3a	8.7/55.8
4. 2nd pipeline, generally paralleling Intertie Aqueduct Reach 3b and 3c	8.7/42.4
5. 2nd pipeline, generally paralleling Petaluma Aqueduct from its junction with Intertie Aqueduct to Kastania Reservoir	5.1/38.8
6. 2nd pipeline, generally paralleling Sonoma Aqueduct	-0-
7. Storage Facilities	-0-
8. Russian River Water Production Facilities	8.7/55.8

9. All Common Facilities except Russian River Water Production Facilities, but including the Potter Valley Project 19.9/146.2

4.4 Remaining Facility, Additional Facility and Replacement Facility Capital Cost Payments by North Marin

The portion of the Capital Costs of the facilities allocated to North Marin pursuant to Section 4.3 shall be recovered by the Agency as follows:

(a) Each time the Agency decides to issue further series or issues of Revenue Bonds to finance the Capital Costs of constructing or acquiring any Remaining Facilities, Additional Facilities, or replacement facilities, or acquiring all or part of the Potter Valley Project, the Agency shall, prior to initiating the procedures for the issuance of such Revenue Bonds, notify North Marin of the Agency's estimate of the total cost of the Remaining Facilities, replacement facilities, Additional Facilities, or Potter Valley Project acquisition proposed to be financed by said series or issues of Revenue Bonds and of North Marin's portion of the cost allocated in accordance with Section 4.3. North Marin shall have the right, at its election, to pay North Marin's portion, or any part or parts thereof, of the cost of such Remaining Facilities, replacement facilities, Additional Facilities, or Potter Valley Project acquisition in cash, provided, however, that North Marin shall make its election on or before such date as the Agency shall specify, which date will give the Agency sufficient time to determine the amount of Revenue Bonds to be sold, but shall not be earlier than 30 days after said notification. If North Marin elects to make a cash payment, it shall do so on the date the Revenue Bonds are sold or on such later date as the Agency may agree upon and which will nevertheless enable the Agency to meet its obligations for said construction or acquisition. If North Marin elects to make a cash payment, the amount payable shall exclude interest during construction and financing charges.

(b) Upon completion of the construction or acquisition referred to in subdivision (a) of this section, any deficiency in the amount theretofore paid or credited and the actual amount of North Marin's portion thereof shall be paid by North Marin to the Agency.

(c) All payments made by North Marin pursuant to subdivisions (a) and (b) of this section shall be deposited in a separate account from which the Agency will make disbursements only to make payments that otherwise must be made by revenues received from the North Marin Capital Charge, or for the Agency's expenses in constructing the Remaining Facilities, Additional Facilities, and replacement facilities or

in acquiring all or part of the Potter Valley Project, up to the proportionate amounts allocated to North Marin utilizing the ratios contained in Section 4.3. The balance of the account shall earn interest at the Sonoma County Treasurer's pooled investment fund rate, which interest income shall be credited to the account on June 30 of each year. Any surplus funds in the account shall be paid to North Marin within 30 days of receipt of a written request therefor.

(d) If the Agency decides to levy one or more Aqueduct Capital Charges to produce revenue to fund, without issuing Revenue Bonds, (a) major replacements of portions or all of any aqueduct facility pursuant to Section 4.6(e) of this Agreement or (b) capital improvements to existing Aqueduct Facilities, then North Marin shall pay its portion of the Capital Costs of such replacements or improvements to the Agency in cash at the time such Capital Costs are incurred by the Agency. The Capital Costs of major replacements to the facilities specified in Subsection 4.3(b) shall be allocated to North Marin based upon the ratios set forth in Subsections 4.3(b). The Capital Costs of major replacements to the Intertie Aqueduct shall be allocated to North Marin based on the following cost distribution ratios:

Intertie Aqueduct Reach 1	11.2/70.4
Intertie Aqueduct Reach 2	11.2/68.9
Intertie Aqueduct Reach 3	11.2/58.9

4.5 Payment of Remaining Facilities, Additional Facilities, Replacement Facilities, and Potter Valley Project Capital Costs

(a) The Capital Costs of Remaining Facilities, Additional Facilities, replacement facilities and Potter Valley Project, except the portions thereof paid by North Marin pursuant to Section 4.4, shall be paid by the Agency with cash available pursuant to Sections 4.2, 4.6, 4.7 and 4.8, subdivision (b) of Section 4.11, and, if the Board of Directors of the Agency decides to issue Revenue Bonds, with the proceeds from the sale of Revenue Bonds. The Agency may sell Revenue Bonds to the extent necessary to pay for said Capital Costs, to establish bond reserves and to pay all expenses incurred in the issuance of such bonds.

(b) From time to time the Agency shall determine the percentage of the Revenue Bonds that are attributable to Aqueduct Facilities, Storage Facilities, Common Facilities, and North Marin's Capital Costs. In making these calculations, the Agency shall not include in the portions of the Revenue Bonds that are attributable to Aqueduct Facilities, Storage Facilities and Common Facilities, the portions of the Revenue Bonds, if any, that

are attributable to North Marin's Capital Costs. The Agency shall not include in these calculations any Capital Costs for which North Marin paid cash pursuant to Section 4.4, or the costs of any major replacement facilities financed by the imposition of Aqueduct Facilities Capital Charges without the issuance of Revenue Bonds pursuant to subdivision (e) of Section 4.6.

4.6 Aqueduct Facilities Capital Charges

(a) Aqueduct Facilities Capital Charges consist of the Santa Rosa Aqueduct Capital Sub-Charge, the Sonoma Aqueduct Capital Sub-Charge, and the Petaluma Aqueduct Capital Sub-Charge. The Aqueduct Facilities Capital Charges shall be annual charges per acre foot set for each aqueduct as provided in subdivision (b) of this section and shall be paid by all Regular Customers of the Agency except North Marin for all water delivered from the Transmission System except Surplus Water. All water delivered to Santa Rosa and Windsor shall be deemed to be delivered from the Santa Rosa Aqueduct, all water delivered to Rohnert Park, Cotati, and Petaluma shall be deemed to be delivered from the Petaluma Aqueduct, and all water delivered to Sonoma and Valley of the Moon shall be deemed to be delivered from the Sonoma Aqueduct.

(b) The aggregate amount to be received by the Agency from the various Aqueduct Facilities Capital Charges for each Fiscal Year shall be sufficient to produce water sale revenues to pay the Agency's Revenue Bond Obligations (after crediting any projected payments to be made pursuant to subdivision (e) of Section 4.6) for such Fiscal Year times the percentage for Aqueduct Facilities determined pursuant to subdivision (b) of Section 4.5, and to produce additional revenues in amounts determined from time to time by the Water Advisory Committee to pay the Capital Costs of Aqueduct Facilities pursuant to subdivision (c) of this section. The aggregate amount shall be allocated to the respective aqueducts based on the following cost distribution ratios applied to the estimated, or when known, actual Capital Costs for the various Aqueduct Facilities:

Facility	Ratio
2nd pipeline, generally paralleling Intertie Aqueduct, Reach 1, Reach 2 and Reach 3a	
Santa Rosa Aqueduct	6.6/55.8
Petaluma Aqueduct	20.9/55.8
Sonoma Aqueduct	6.8/55.8

2nd pipeline, generally paralleling Intertie Aqueduct, Reach 3b and 3c

Santa Rosa Aqueduct	-0-
Petaluma Aqueduct	20.9/42.4
Sonoma Aqueduct	-0-

2nd pipeline, generally paralleling Petaluma Aqueduct from its junction with the Intertie Aqueduct to Kastania Reservoir

Santa Rosa Aqueduct	-0-
Petaluma Aqueduct	20.9/38.8
Sonoma Aqueduct	-0-

2nd pipeline, generally paralleling Sonoma Aqueduct

Santa Rosa Aqueduct	-0-
Petaluma Aqueduct	-0-
Sonoma Aqueduct	6.8/6.8

(These ratios are determined with the allocations in Sections 4.3 and 4.4 of Capital Costs to North Marin, and with the following allocations to Common Facilities:

2nd pipeline generally paralleling Reaches 1, 2 and 3a of the Intertie Aqueduct: 12.8/55.8

2nd pipeline generally paralleling Reach 3b and 3c of the Intertie Aqueduct: 12.8/42.4

2nd pipeline generally paralleling the Petaluma Aqueduct from its junction with the Intertie Aqueduct to Kastania Reservoir: 12.8/38.8)

(c) All money received by the Agency in payment of Aqueduct Facilities Capital Charges shall be deposited and paid out as set forth in Section 1.7 and subdivision (b) of Section 4.1. After making the payments required to satisfy the Agency obligations and covenants with respect to the Revenue Bonds used to finance the Capital Cost of the Aqueduct Facilities, remaining money received from the Aqueduct Facilities Capital

Charges may be disbursed from time to time to pay pursuant to subdivision (a) of Section 4.5 the portions of the Capital Costs of the Remaining Facilities and Additional Facilities which are also Aqueduct Facilities that are not allocated to North Marin in Section 4.3.

(d) If at the end of any Fiscal Year the balance in the Aqueduct Facilities Capital Charge fund is insufficient to meet said Revenue Bond Obligations for the ensuing Fiscal Year attributed to the Aqueduct Facilities, Agency will determine the deficits in the payment received by it for deliveries from the Santa Rosa, Petaluma, and Sonoma Aqueducts respectively. Before August 1 of the following Fiscal Year:

(1) Additional charges for water delivered in amounts equal to the deficits with respect to the Santa Rosa Aqueduct shall be paid by Santa Rosa and Windsor in the following manner: The share of such additional charge to be paid by each of said Water Contractors shall be proportionate to the difference between the base share component and the sum of the Aqueduct Facilities Capital Charge payments made by said Water Contractor during said Fiscal Year. The base share component allocated to a Water Contractor is the number obtained by multiplying the said total principal and interest payment for said Fiscal Year by said Water Contractor's average daily rate of flow during any month Entitlement Limit set forth in subdivision (a) of Section 3.1 and by dividing by the total of said average daily rate of flow during any month Entitlement Limits for all Water Contractors being served from the Santa Rosa Aqueduct.

(2) Additional charges for water delivered in an amount equal to the deficit with respect to the Sonoma Aqueduct shall be paid by Sonoma and Valley of the Moon in the following manner: The share of such additional charge to be paid by each of said Water Contractors shall be proportionate to the difference between the base share component and the sum of the Aqueduct Facilities Capital Charge payments made by said Water Contractor during said Fiscal Year. The base share component allocated to a Water Contractor is the number obtained by multiplying the said total principal and interest payment for said Fiscal Year by said Water Contractor's average daily rate of flow during any month Entitlement Limit set forth in subdivision (a) of Section 3.1 and by dividing by the total of said average daily rate of flow during any month Entitlement Limits for all Water Contractors being served from the Sonoma Aqueduct.

(3) Additional charges for water delivered in an amount equal to the deficit with respect to the Petaluma Aqueduct shall be paid by Rohnert Park, Cotati and Petaluma in the following manner excluding North Marin and Marin Municipal: The share of such additional charge to be paid by each of said Water Contractors shall be

proportionate to the difference between the base share component and the sum of the Aqueduct Facilities Capital Charge payments made by said Water Contractor during said Fiscal Year. The base share component allocated to a Water Contractor is the number obtained by multiplying said total principal and interest payment for said Fiscal Year by said Water Contractor's average daily rate of flow during any month Entitlement Limit set forth in subdivision (a) of Section 3.1 and by dividing by the total of all said average daily rate of flow during any month Entitlement Limits for all Water Contractors being served from the Petaluma Aqueduct.

(e) If the Agency decides to issue a new series or issue of Revenue Bonds to finance major replacements of portions or all of any aqueduct facility or if, with the approval of the Water Advisory Committee, the Agency decides to levy one or more Aqueduct Facilities Capital Charges to produce revenue to finance major replacements of portions or all of any aqueduct facility, then the aggregate amount to be received by the Agency from the respective Aqueduct Facilities Capital Charges for each Fiscal Year shall be sufficient to produce water sales revenues, in addition to those required by subdivision (b) of this section, in amounts determined from time to time by the Water Advisory Committee to pay the Capital Costs of such major replacements. The Capital Costs of major replacements to the facilities specified in Subsection 4.6(b) above shall be allocated based upon the ratios set forth in Subsection 4.6(b). The Capital Costs of major replacements to the Intertie Aqueduct shall be allocated to the respective aqueducts based on the following cost distribution ratios:

Intertie Aqueduct Reach 1:

Santa Rosa Aqueduct	31.5/70.4
Petaluma Aqueduct	19.7/70.4
Sonoma Aqueduct	8.0/70.4

Intertie Aqueduct Reach 2:

Santa Rosa Aqueduct	30.0/68.9
Petaluma Aqueduct	19.7/68.9
Sonoma Aqueduct	8.0/68.9

Intertie Aqueduct Reach 3:

Santa Rosa Aqueduct	20.0/58.9
Petaluma Aqueduct	19.7/58.9
Sonoma Aqueduct	8.0/58.9

4.7 Storage Facilities Capital Charge

(a) The Storage Facilities Capital Charge shall be a uniform annual charge per acre foot and shall be paid by all Regular Customers of the Agency for all water delivered from the Transmission System except Surplus Water, provided however, that North Marin shall not be obligated to pay any Storage Facilities Capital Charge if North Marin maintains potable storage reservoirs within its system with a total capacity equal to or greater than one and one-half times the average daily volume of water delivered by the Agency to North Marin during the previous July with the highest water delivery to North Marin.

(b) The aggregate amount to be received by the Agency from the Storage Facilities Capital Charge for each Fiscal Year shall be sufficient to produce water sale revenues to pay the Agency's Revenue Bond Obligations for such Fiscal Year (after crediting any projected payments to be made pursuant to subdivision (e) of Section 4.6) times the percentage for Storage Facilities determined pursuant to subdivision (b) of Section 4.5, and to produce additional revenues in amounts determined from time to time by the Water Advisory Committee to pay the Capital Costs of Storage Facilities pursuant to subdivision (c) of this section.

(c) All money received by the Agency in payment of the Storage Facilities Capital Charge shall be deposited and paid out as set forth in Section 1.7, and subdivision (b) of Section 4.1. After making the payments from the Storage Facilities capital fund required by Section 1.7, remaining money in said fund may be disbursed from time to time to pay Capital Costs of Remaining Facilities, Additional Facilities and replacement facilities that also are Storage Facilities, pursuant to Section 4.5.

(d) If at the end of any Fiscal Year the balance in the Storage Facilities capital fund is insufficient to meet said Revenue Bond Obligations for such Fiscal Year attributed to the Storage Facilities, each Water Contractor except North Marin will, before August 1, pay to the Agency an additional charge per acre foot for all water delivered to it during the Fiscal Year which additional charge when multiplied by all Acre Feet sold to Regular Customers except North Marin shall be equal to said deficit.

4.8 Common Facilities Capital Charge

(a) The Common Facilities Capital Charge shall be a uniform annual charge per acre foot and shall be paid by all Regular Customers of the Agency except North Marin for all water delivered from the Transmission System except Surplus Water.

(b) The aggregate amount to be received by the Agency from the Common Facilities Capital Charge for each Fiscal Year shall be sufficient to produce water sale revenues to pay the Agency's Revenue Bond Obligations for such Fiscal Year (after crediting any projected payments to be made pursuant to subdivision (e) of Section 4.6) times the percentage for Common Facilities determined pursuant to subdivision (b) of Section 4.5.

(c) All money received by the Agency in payment of the Common Facilities Capital Charge shall be deposited and paid out as set forth in Section 1.7 and subdivision (b) of Section 4.1. After making the payments required by Section 1.7, additional money received from the Common Facilities Capital Charge may be disbursed from time to time pursuant to subdivision (a) of Section 4.5 to pay the portions of the Capital Costs of Remaining Facilities, Additional Facilities, replacement facilities and the Potter Valley Project that also are Common Facilities and that are not allocated to North Marin in Section 4.3, and to satisfy the requirements of Section 6.04 of Ordinance No. 1 if the amount of money received from the charge established by Section 4.2 is insufficient in any Fiscal Year.

(d) If at the end of any Fiscal Year the balance in the Common Facilities capital fund is insufficient to meet the Agency's Revenue Bond Obligations for such Fiscal Year on the Revenue Bonds attributed to Common Facilities, each Water Contractor except North Marin shall, before August 1, pay to the Agency an additional charge per acre foot for water delivered to it during the Fiscal Year, which additional charge when multiplied by all Acre Feet sold to the Water Contractors shall be equal to said deficit.

4.9 North Marin Capital Charge

(a) The North Marin Capital Charge shall be a uniform annual charge per acre foot and shall be paid by North Marin for all water delivered to it from the Transmission System except Surplus Water.

(b) The aggregate amount to be received by the Agency from the North Marin Capital Charge for each Fiscal Year shall be sufficient to produce water sale revenues to pay the Agency's Revenue Bond Obligations for such Fiscal Year (after crediting any projected

payments to be made pursuant to subdivision (e) of Section 4.6) times the percentage for North Marin's Capital Costs determined pursuant to subdivision (b) of Section 4.5.

(c) All money received by the Agency in payment of North Marin Capital Charge shall be deposited and paid out as set forth in Section 1.7 and subdivision (b) of Section 4.1. After making any payments required by Section 1.7, additional money received from the North Marin Capital Charge shall be deposited in the separate account described in subdivision (c) of Section 4.4.

(d) If at the end of any Fiscal Year the balance in the separate fund described in subdivision (c) of Section 4.4 is insufficient to meet the portion of the Agency's Revenue Bond Obligations for such Fiscal Year on the Revenue Bonds attributed to North Marin's Capital Costs, North Marin will, before August 1, pay to the Agency an additional charge per acre foot for water delivered to it during the Fiscal Year, which additional charge when multiplied by all Acre Feet sold to North Marin shall be equal to said deficit.

(e) If any money received pursuant to the Common Facilities Capital Charge is used pursuant to subdivision (c) of Section 4.8 to satisfy the requirements of Section 6.04 of Ordinance No. 1, then the North Marin Capital Charge shall be increased by the appropriate amount so that North Marin pays its appropriate share of such requirements.

(f) If North Marin has not maintained storage reservoirs within its system with at least the capacity required by subdivision (a) of Section 4.7, and if, as a result, the Agency constructs additional storage, then the North Marin Capital Charge shall be increased by an amount sufficient to pay for the Capital Costs or Revenue Bonds costs of such additional storage.

4.10 Power; Revenues

All power from the Warm Springs Hydroelectric Project and the Potter Valley Project shall be applied to the operation of the Transmission System or shall be sold, as the Agency shall from time to time determine. All revenues arising from the operation of these projects shall be treated the same as money received from the Operation and Maintenance Charge and shall be deposited and paid out as set forth in Section 1.7 and subdivision (b) of Section 4.1.

4.11 Payment for Surplus Water and Water Sold To Marin Municipal

(a) The Agency will sell Surplus Water at a price per acre foot of not less than 120% of the then current Operation and Maintenance Charge. All revenue from the sale of Surplus Water shall be treated the same as money received from the Operation and Maintenance Charge and shall be deposited and paid out as set forth in Section 1.7 and subdivision (b) of Section 4.1.

(b) Water delivered to Marin Municipal shall be sold at a per acre foot price that shall not be less than the sum of the Operation and Maintenance Charge determined pursuant to Section 4.2, the Russian River Conservation and Russian River Projects Charges determined pursuant to Section 4.18, and a capital charge. For the Third Amended Offpeak Water Supply Agreement dated January 25, 1996, or any amendment to that agreement that has been approved by the Water Advisory Committee, the capital charge shall be the total of all charges paid to Agency by Marin Municipal minus the sum of the Operation and Maintenance Charge and the Russian River Conservation and Russian River Projects Charges. For the Amended Agreement For The Sale of Water Between the Sonoma County Water Agency and Marin Municipal Water District dated January 25, 1996, or any amendment to that agreement that has been approved by the Water Advisory Committee, the capital charge shall be the charge established by paragraph b. of Section 10 of that agreement. Any subsequent agreement between the Agency and Marin Municipal for the sale of water to be transported through the Transmission System pursuant to Section 3.12 shall specify the capital charge that applies to this section of this Agreement. All money received by the Agency from the Operation and Maintenance Charge on water sold to Marin Municipal shall be credited to the operation and maintenance fund. All money received by the Agency from the Russian River Conservation and Russian River Projects Charges on water sold to Marin Municipal shall be credited to the Russian River Projects Fund and shall be used only for the purposes set forth in subsection (jj) of Section 1.2. The balance of the money received by the Agency from water sold to Marin Municipal shall be deposited and paid out as set forth in Section 1.7, and subdivision (b) of Section 4.1. After making the payments required by Section 1.7 and Ordinance No. 1, additional money received may be disbursed from time to time to pay the Capital Costs of Storage Facilities or Common Facilities authorized to be constructed in Section 2.2, provided, however, that only the money received from $31.50 per acre foot of the capital charge (which rate is based on the Agency's past and projected future capital investment in Storage Facilities) may be used to pay the Capital Costs of new Storage Facilities.

4.12 Minimum Payments by Other Agency Customers

Anything herein to the contrary notwithstanding, the Agency will not sell any water to be delivered through the Transmission System (other than Surplus Water) to any Other Agency Customer at a total price per acre foot that is less than 120% of the highest price per acre foot then currently being paid by any Water Contractor; provided, however, that this limitation shall not apply to water sold to Forestville. The respective components of said price shall be credited to the appropriate fund referred to in subdivision (a) of Section 4.1 and the excess shall be credited to the aqueduct capital fund for the aqueduct from which service is taken. Forestville's charge shall be the same as the total charge for Water Contractors for water delivered from the Santa Rosa Aqueduct, except that during the first ten (10) full Fiscal Years following execution of this Agreement, Forestville shall not pay the Santa Rosa Aqueduct Capital Sub-Charge.

4.13 Operations and Maintenance Charge – Water Management Planning

The Agency shall calculate and collect as a part of the Operations and Maintenance Charge a Water Management Planning Sub-Charge. The aggregate amount of money to be received by the Agency from the Water Management Planning Sub-Charge in each Fiscal Year shall be sufficient to produce water sale revenues to cover the Agency's reasonable estimate of its costs for such Fiscal Year to carry out the provisions of Section 2.7. All money received by the Agency in payment of the Water Management Planning Sub-Charge shall be deposited by the Agency into a Water Management Planning Fund and used to pay the Agency's costs in carrying out the provisions of Section 2.7.

4.14 Operations and Maintenance Charge – Watershed Planning and Restoration

(a) The Agency shall calculate and collect as a part of the Operations and Maintenance Charge a Watershed Planning and Restoration Sub-Charge.

(b) The aggregate amount of money to be received by the Agency from the Watershed Planning and Restoration Sub-Charge in each Fiscal Year shall be sufficient to produce water sale revenues to cover the Agency's reasonable estimate of costs for such Fiscal Year (net of funding provided by other sources, including the Russian River Projects Fund and the Agency's General Fund) of carrying out: (1) fishery mitigation, enhancement, and environmental compliance activities and projects undertaken by the Agency, including the Agency's costs of complying with the Endangered Species Act or any other applicable federal, state, or local environmental statute or regulation, if such

activities, projects, and costs are reasonably necessary, to enable the Agency to provide water to Regular Customers under this Agreement; (2) the evaluations undertaken pursuant to Section 2.4(b); and (3) actions, studies or projects authorized pursuant to Section 2.8 of this Agreement that are not covered by other funding sources and contributions. The Agency shall not use proceeds from the Watershed Planning and Restoration Sub-Charge to pay for the capital cost or operation and maintenance cost of recreation facilities.

(c) Notwithstanding Subsection 4.14(b) above, during the first five full Fiscal Years following the effective date of this Agreement, the Watershed Planning and Restoration Sub-Charge shall not exceed $35.00 per acre-foot.

(d) To assist in determining the appropriate share of fishery mitigation, enhancement, and environmental compliance activities and projects undertaken by the Agency to be paid by the Water Contractors under the Watershed Planning and Restoration Sub-Charge, the Agency shall, from time to time as reasonably necessary, prepare an analysis that (1) identifies planned fishery mitigation, enhancement, and environmental compliance activities and projects, (2) identifies the costs and beneficiaries of such activities and projects, (3) proposes an allocation of costs among all benefitted parties, and (4) recommends sources of funding for such activities and projects.

(e) The Agency shall use its best efforts to amend its existing contracts with Russian River Customers to require Russian River Customers to pay the Watershed Planning and Restoration Sub-Charge or fund or implement watershed planning and restoration projects at a level equivalent to that funded by the Agency under this Agreement.

(f) In addition to the Watershed Planning and Restoration Sub-Charge, the Agency may assess against the Water Contractors such supplemental charges as are authorized and agreed to under Section 2.8(c). Supplemental charges under this subsection shall not be included in determining the minimum payments by Other Agency Customers pursuant to Section 4.12 or by Windsor pursuant to Section 4.17.

(g) All money received by the Agency in payment of the Watershed Planning and Restoration Sub-Charge shall be deposited by the Agency into a Watershed Planning and Restoration Fund and used for the purposes set forth in Section 4.14(b). All money received by the Agency in payment of any supplemental charges pursuant to Section 4.14(d) shall be deposited into separate account(s) and used to pay the costs of projects authorized and agreed to pursuant to Section 2.8(c).

4.15 Operations and Maintenance Charge – Recycled Water and Local Supply

The Agency shall calculate and collect as a part of the Operations and Maintenance Charge a Recycled Water and Local Supply Sub-Charge. The Recycled Water and Local Supply Sub-Charge shall be a uniform charge per acre-foot and shall be paid by all Regular Customers and Russian River Customers for all water taken from the Transmission System or under the Agency's water rights. The aggregate amount of money to be received by the Agency from the Recycled Water and Local Supply Sub-Charge in each Fiscal Year shall be sufficient to produce water sale revenues to cover the Agency's estimate of its costs for such Fiscal Year to carry out the provisions of Section 2.6; provided, however, that during the first five full Fiscal Years following the effective date of this Agreement, the Recycled Water and Local Supply Sub-Charge shall not exceed $35.00 per acre-foot. The Agency shall use its best efforts to amend its existing contracts with Russian River Customers to require Russian River Customers to pay the Recycled Water and Local Supply Sub-Charge. Monies collected from the Recycled Water and Local Supply Sub-Charge shall be deposited in a Recycled Water and Local Supply Fund created by the Agency. The Recycled Water and Local Supply Fund shall be used only to pay or partially pay for the costs of Recycled Water Projects or the acquisition of Recycled Water or the rights thereto pursuant to Section 2.6 of this Agreement. Notwithstanding the foregoing sentence, revenue from the Recycled Water and Local Supply Sub-Charge collected by the Agency from Windsor pursuant to Section 4.17(b) shall be placed in a separate account and made available to Windsor for funding Windsor's local or regional Recycled Water Projects.

4.16 Operations and Maintenance Charge – Water Conservation

(a) The Agency shall calculate and collect as a part of the Operations and Maintenance Charge a Water Conservation Sub-Charge. Monies collected from the Water Conservation Sub-Charge shall be deposited in a Water Conservation Fund created by the Agency. The Water Conservation Fund shall be used only to pay or partially pay for the cost of Water Conservation Projects. The aggregate amount of money to be received by the Agency from the Water Conservation Sub-Charge for each Fiscal Year shall be sufficient to cover the Agency's estimate of the total cost of all Water Conservation Projects for such Fiscal Year. From and after July 1, 1998, a total of fifteen million dollars ($15,000,000) shall be expended to implement Water Conservation Projects pursuant to the Water Conservation Plan dated June 29, 1998. The $15,000,000 shall be allocated as follows: Cotati 2.10%, Petaluma 18.53%, Rohnert Park 10.37%, Santa Rosa 40.25%, Sonoma 4.15%, Forestville 0.66%, North Marin 19.50%, Valley of the Moon 4.43%. Until the total of $15,000,000 has been expended as set forth above, the

Agency shall not fund Water Conservation Projects for or on behalf of Windsor. The Water Conservation Projects for which said $15,000,000 is to be expended, have been approved by the Water Advisory Committee.

(b) The Agency shall use its best efforts to amend its existing contracts with Russian River Customers to require Russian River Customers to fund or implement Water Conservation Projects at a level equivalent to that funded by the Agency under this Agreement. Notwithstanding the penultimate sentence in Section 4.16(a), revenue from the Water Conservation Sub-Charge collected by the Agency from Windsor pursuant to Section 4.17(b) shall be placed in a separate account and made available to Windsor for funding Windsor's Water Conservation Projects.

4.17 Payments by Town of Windsor

(a) Notwithstanding anything in this Agreement to the contrary, for the first fifteen (15) full Fiscal Years following execution of this Agreement, the amount payable by Windsor for water delivered by the Agency through the Transmission System shall be 120% of the highest price per acre foot then currently being paid by any Water Contractor receiving water from the Santa Rosa Aqueduct. The respective components of said price shall be credited to the appropriate fund referred to in subdivision (a) of Section 4.1 and the excess shall be credited to the aqueduct capital fund for the aqueduct from which service is taken. Beginning with the sixteenth (16th) full Fiscal Year following execution of this Agreement and thereafter, all water delivered to Windsor by Agency through the Transmission System will be deemed delivered from the Santa Rosa Aqueduct and the amount payable by Windsor for said water determined accordingly.

(b) For all water diverted directly by Windsor from the Russian River using its own facilities, whether under the Agency's water rights or Windsor's water rights, Windsor shall pay only the charges set forth in the Agreement for Sale of Water between the Agency and Windsor dated January 8, 1991, as amended, including the sub-charges set forth in Sections 4.13, 4.14, 4.15, and 4.16.

4.18 Payment of Russian River Conservation Charge and Russian River Projects Charge by North Marin

In addition to the other charges provided for in this Part, North Marin shall pay the following additional per-acre-foot charges:

(a) A Russian River Conservation Charge shall be paid in lieu of the property taxes levied by the Agency on property in Sonoma County, to pay the capital, Operation and Maintenance Costs associated with the Warm Springs Dam Project. The Russian River Conservation Charge shall be a charge per acre foot of water delivered to North Marin hereunder, except Surplus Water. The charge shall be determined annually on or before April 30 preceding each Fiscal Year and shall be payable by North Marin during the ensuing Fiscal Year. The Russian River Conservation Charge shall be determined by multiplying the tax rate levied by the Agency in the then current Fiscal Year to pay the costs associated with the Warm Springs Dam Project times the assessed value of secured and unsecured property situated within Cotati, Petaluma, Rohnert Park, Santa Rosa, Sonoma, Forestville and Valley of the Moon and dividing the product by the total number of Acre Feet of water delivered to Cotati, Petaluma, Rohnert Park, Santa Rosa, Sonoma, Forestville and Valley of the Moon pursuant to Section 3.1 and 3.3 during the twelve month period ending on March 31. All money received by the Agency from the Russian River Conservation Charge on water sold to North Marin shall be credited to the Russian River Projects Fund and shall be used only for the purposes set forth in subsection (jj) of Section 1.2.

(b) A Russian River Projects Charge shall be paid in lieu of the property taxes levied on property in Sonoma County and other Agency general fund monies which are transferred to the Agency's Russian River Projects Fund and expended for the purposes enumerated in subsection (jj) of Section 1.2. The Russian River Projects Charge shall be effective on the first day of the first month following the effective date of this Agreement and shall thereafter be determined annually on or before April 30 preceding each Fiscal Year and shall be payable by North Marin during the ensuing Fiscal Year. The Russian River Projects Charge shall be determined by dividing the total amount of Agency monies expended from the Agency's Russian River Projects Fund in the preceding ten Fiscal Years, exclusive of the funds contributed to the Fund by North Marin and Marin Municipal Water District, and interest earnings attributable to funds contributed by North Marin and Marin Municipal Water District, by the sum of the total acre-feet of water delivered by the Agency to Cotati, Petaluma, Rohnert Park, Santa Rosa, Sonoma, Forestville and Valley of the Moon pursuant to Sections 3.1 and 3.3 of this Agreement during the preceding ten Fiscal Years and multiplying the quotient by the ratio that the assessed value of secured and unsecured property situated within Cotati, Petaluma, Rohnert Park, Santa Rosa, Sonoma, Forestville and Valley of the Moon bears to the assessed value of all secured and unsecured property within Sonoma County, provided, however, in no event shall the Russian River Projects Charge exceed $20.00 per acre-foot. The Agency shall keep proper books, records and accounts in which complete and accurate entries shall be made of all Agency general fund monies

transferred to the Agency's Russian River Projects Fund and all expenditures made from the fund for the purposes set forth in subsection (jj) of Section 1.2. The Agency shall maintain a separate account within the Russian River Projects Fund for Russian River Projects Charges paid by North Marin and Marin Municipal Water District. Monies expended from the Russian River Projects Fund shall be deemed to have been expended from the North Marin and Marin Municipal Water District account in the proportion that the balance of that account bears to the total Russian River Projects Fund balance at the end of the Fiscal Year quarter preceding the expenditure. All money received by the Agency from the Russian River Projects Charge on water sold to North Marin shall be credited to the Russian River Projects Fund and shall be used only for the purposes set forth in subsection (jj) of Section 1.2.

4.19 Billing and Time of Payment

Except as otherwise expressly provided herein, all charges payable to the Agency shall be billed each month and paid within 30 days after receipt of bill. Notwithstanding any dispute between the Agency and a Water Contractor, such Water Contractor will pay all its bills when due and shall not withhold all or any part of any payment pending the final resolution of such dispute. If the resolution of the dispute results in a refund to the Water Contractor, the Agency shall make such refund plus any interest earned by investment of the disputed funds as promptly as it is able to do so, consistent with its meeting its Revenue Bond Obligations.

PART 5 - Water Advisory Committee/Technical Advisory Committee

5.1 Purpose

(a) There is hereby created the Water Advisory Committee and the Technical Advisory Committee.

(b) The purpose of the Water Advisory Committee is to perform the functions specified herein and to review all proposals set forth by the Agency which involve a significant capital outlay for the Transmission System or any other project which would significantly change the level of service or add significantly to the operations and maintenance expense of the Transmission System or other expense to be borne by the Water Contractors. The purpose of the Technical Advisory Committee is to advise the Water Advisory Committee.

5.2 Powers

Except as provided herein to the contrary, the power of the Water Advisory Committee is limited to that of collective spokesperson for the Water Contractors and shall be advisory only in nature. Nothing shall preclude a Water Contractor from setting forth a view contrary to that of the majority of the Committee. No action of the Committee limits or impairs any right or power of any Water Contractor. The Technical Advisory Committee shall have no powers other than the power to make recommendations to the Water Advisory Committee.

5.3 Composition and Voting

(a) The Water Advisory Committee shall be composed of one representative and one alternate who shall serve in absence of the representative, to be selected by each Water Contractor. The representative and alternate shall be elected members of and appointed by the governing board of the Water Contractor. The Water Advisory Committee shall generally meet quarterly as it determines necessary, which shall include at least one meeting per calendar year with a liaison from the Board of Directors of the Agency who is a member of and appointed by said Board. Each Water Contractor's representative will be allocated a weighted vote proportional to the average daily rate of flow during any month Entitlement Limit from the Transmission System applicable to such Water Contractor. An affirmative vote of said Committee shall be recorded and require both of the following: (1) the affirmative vote of more than fifty percent (50%) of the total weighted votes as defined above; and (2) the

affirmative vote of at least five (5) representatives. If the Water Advisory Committee does not affirmatively vote to approve any matter before it for a decision, then the matter shall be deemed not approved. A representative or alternate appointed by the Board of Directors of the Marin Municipal Water District, each of which must be members of said board, may attend and participate, debate, express opinions and present information at meetings of the Water Advisory Committee but shall not have a vote. If the approval, determination, or consent of the Water Advisory Committee is authorized or required on any non-advisory matter pursuant to this Agreement, the vote of the Water Advisory Committee on such matter shall be evidenced by a writing, executed by the chairperson or secretary, evidencing (a) the vote of each member, (b) whether the vote of the Committee was in the affirmative, and (c) if the vote was in the affirmative, a description of the approval, determination, or consent given by the Committee.

(b) The Technical Advisory Committee shall be composed of one non-elected representative selected by each Water Contractor. The Technical Advisory Committee shall generally meet monthly as it determines necessary. Each Water Contractor's representative will be allocated the same weighted vote applicable to that Water Contractor under Section 5.3(a). An affirmative vote of said Committee shall require both of the following: (1) the affirmative vote of more than fifty percent (50%) of the total weighted votes as defined above; and (2) the affirmative vote of at least five (5) representatives. A representative or alternate appointed by the Marin Municipal Water District Board of Directors may attend and participate, debate, express opinions and present information at meetings of the Water Advisory Committee but shall not have a vote. The Water Advisory Committee may require the Technical Advisory Committee to create subcommittees and ad hoc committees. Persons serving on such committees shall be elected officials, staff or contract staff of the Water Contractor they represent.

(c) The Technical Advisory Committee shall create a standing Water Conservation Subcommittee. The Water Conservation Subcommittee shall make recommendations to the Technical Advisory Committee with respect to any determination of the Water Advisory Committee contemplated under Section 1.12 of this Agreement, and shall perform other such duties with respect to Water Conservation Projects as may be requested by the Technical Advisory Committee.

(d) Once every two years, on a date selected by the Water Advisory Committee, the Water Advisory Committee shall elect from among its members two officers: a chairperson and vice chairperson. Officers shall serve for the ensuing two Fiscal Years. An officer may serve a second or subsequent consecutive two-year terms only if each

such term is approved by a unanimous vote of the Water Contractors. Furthermore, an officer can be removed and replaced at any meeting called by five Water Advisory Committee members provided all Water Advisory Committee members are notified in writing a minimum of five working days prior to the meeting. In the event an officer either: (1) loses his/her status as a duly elected local official serving on the governing board of the Water Contractor they represent or (2) loses his/her appointment as representative of the Water Contractor on the Water Advisory Committee, the officer position held shall be vacated. The Water Advisory Committee shall elect a new officer who shall fill out the balance of the vacated term. Voting for officers shall be as provided in subsection (a) of this section.

(e) By November of each year, subject to the limitations in Section 4.16(a), the Water Advisory Committee shall review proposed Water Conservation Projects, Recycled Water Projects, and Local Supply Projects and approve and report to the Agency those projects that are to receive funding in the next or later fiscal years. It is the intent of the parties to this Agreement that over the term of the Agreement, Regular Customers shall receive funding support for Water Conservation Projects, Recycled Water Projects, and Local Supply Projects in proportion to the amounts paid by Regular Customers under Sections 4.15 and 4.16.

(f) Commencing with the first Fiscal Year following the effective date of this Agreement, the Agency shall include in its operating budget the amount of $30,000 which the Agency shall expend as the Water Advisory Committee directs for purposes associated with the orderly implementation and operation of the provisions of this Agreement and other associated purposes deemed appropriate by the Committee. The annual amount may be fixed at a higher or lower amount in subsequent Fiscal Years as determined by vote of the Committee pursuant to subsection (a) of this section. The Water Advisory Committee shall decide which, if any, consultant or consultants, firm or firms shall be hired to carry out this work.

IN WITNESS WHEREOF, the parties have executed this Agreement on the date first above written.

SONOMA COUNTY WATER AGENCY

By: Paul L. Kelley Date: 6/23/06

ATTEST:

Clerk

CITY OF COTATI

By: Mayor Date: 5.9.06

ATTEST:

City Clerk Date: 5-10-06

CITY OF PETALUMA

By: Mayor Date: 5-15-06

ATTEST:

Deputy City Clerk

CITY OF ROHNERT PARK

By: Mayor Date: 06-05-06

ATTEST:

City Clerk

CITY OF SANTA ROSA

By: Date: 5/31/06

Mayor

ATTEST:

Deputy City Clerk

CITY OF SONOMA

By: Date: 4-19-06

Mayor

ATTEST:

City Clerk

FORESTVILLE COUNTY WATER DISTRICT

Date: 5/12/06

By:

President

ATTEST:

Secretary

NORTH MARIN WATER DISTRICT

Date: 5/22/06

By: _____
President

ATTEST:

_____ Acting Secretary

TOWN OF WINDSOR

Date: 5-17-06

_____
Mayor

ATTEST:

_____
Deputy Town Clerk

VALLEY OF THE MOON WATER DISTRICT

Date: 5-25-06

By: _____
President

ATTEST:

_____
Deputy Secretary

APPENDIX D – RECYCLED WATER FEASIBILITY STUDY

CITY OF COTATI

RECYCLED WATER FEASIBILITY STUDY

Prepared by:

WINZLER & KELLY
CONSULTING ENGINEERS

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in Association with

CH2MHILL

March 2007

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Appendices (Not included in Draft)

List of Tables

List of Figures

List of Abbreviations and Acronyms

AF, ac-ft .....Acre Feet
ABAG.....Association of Bay Area Governments
BPU .....Board of Public Utilities
City.....City of Cotati
C/I.....Commercial and Industrial
CCI .....Construction Cost Index
CEQA.....California Environmental Quality Act
COP .....Certificate of Participation
DAFT.....Dissolved Air Flotation Thickening
EIR.....Environmental Impact Report
ENR.....Engineering News Record
FY.....Fiscal Year
GIS.....Geographic Information System
GPL.....Geysers Pipeline
HGL.....Hydraulic Grade Line
HL.....Head Loss
IRWMP .....Integrated Regional Water Management Plan
IRWP .....Incremental Recycled Water Program
LF.....Linear Foot
MG.....Million Gallons
MGD.....Million Gallons per Day
MGY .....Million Gallons per Year
MMWD.....Marin Municipal Water District
MOU .....Memorandum of Understanding
NCIRWMP .....North Coast Integrated Regional Water Management Plan
NEPA .....National Environmental Policy Act
NOP.....Notice of Preparation
NPDES.....National Pollutant Discharge Elimination System

O&M .....Operations and Maintenance

P/I .....Public Institutional

psi .....Pounds per Square Inch

RP .....Rohnert Park

SCWRHRP .....Sonoma County Water Recycling and Habitat Restoration Project

SCWA, Agency .....Sonoma County Water Agency

SPA.....Specific Plan Area

SWT.....Surface Water Treatment

UGB.....Urban Growth Boundary

UWMP .....Urban Water Management Plan

WRP .....Water Reclamation Plant

WSTSP .....Water Supply and Transmission System Project

Chapter 1 Study Area Characteristics

1.1 Introduction

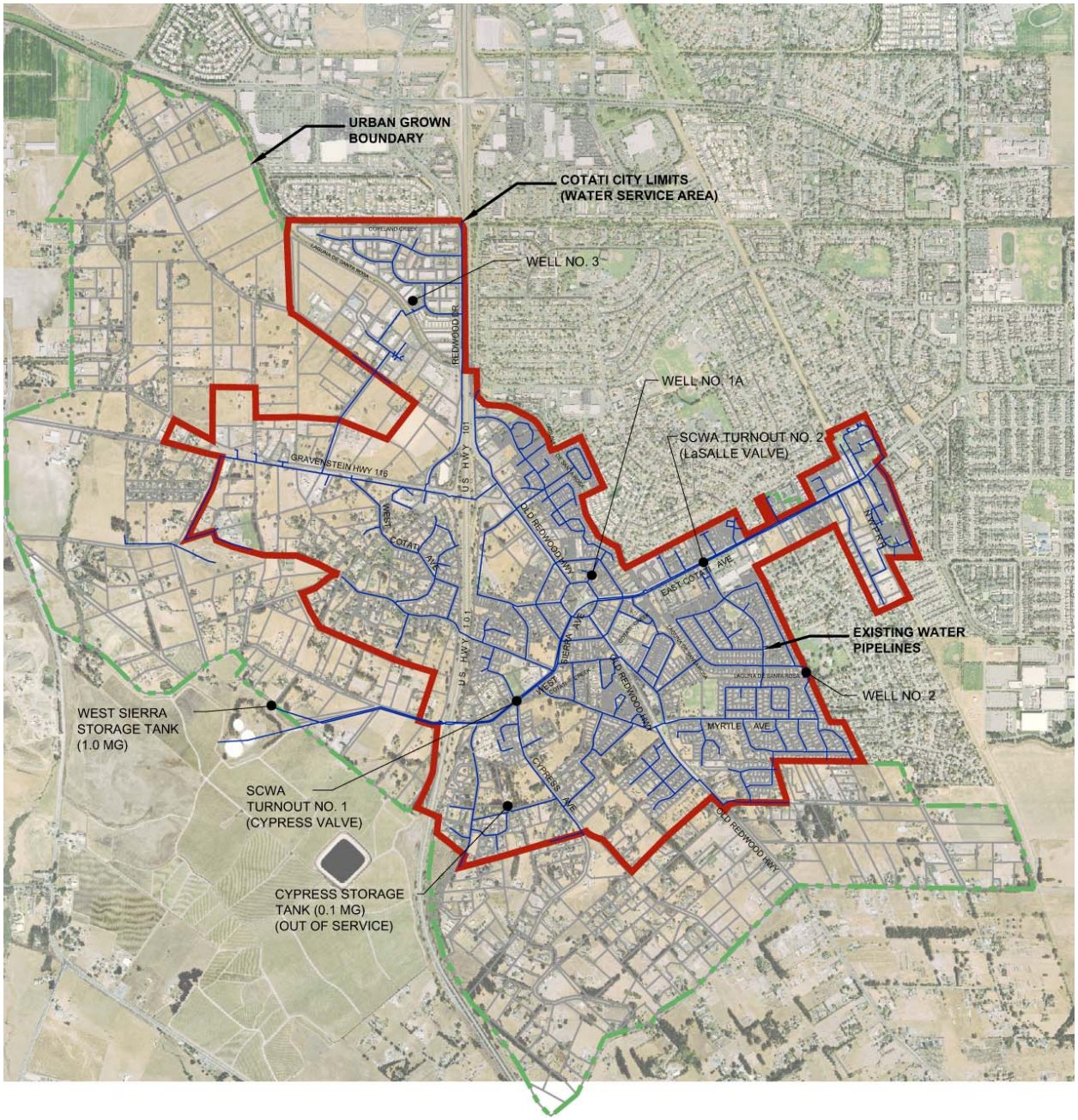
This chapter describes the general characteristics of the Study Area for the Cotati Urban Reuse Project (Project). Also, this chapter includes background on the Study Area including land use and population information.

1.2 Background and Study Area Description

The Study Area, illustrated in Figure 1-1, is bounded by the city limits of the City of Cotati (City). This Study Area is generally consistent with the City's water service area and includes approximately 1,200 acres. The City is a user of the Santa Rosa Subregional Water Reuse System (Subregional System), which provides wastewater treatment, disposal and water recycling services for the cities of Cotati, Rohnert Park, Santa Rosa, Sebastopol and the South Park Sanitation District. The Study Area was included in the analysis for the Subregional System's Incremental Recycled Water Program (IRWP) Master Plan and Environmental Impact Report (EIR). The IRWP documents urban reuse within Cotati, Rohnert Park and Santa Rosa, as one of the Program Alternatives that will allow the Subregional System to manage recycled water flows and regulatory requirements through approximately 2020.

This Feasibility Study provides a more detailed technical analysis of the potential for developing a recycled water delivery system within the Study Area in order to provide both water supply and wastewater disposal benefits.

Figure 1-1: Study Area



Planning Horizon

The City's 1998 General Plan Update (General Plan) projects population through the year 2010, which is a relatively near-term planning horizon. The General Plan was used by the Subregional System in developing its IRWP Master Plan and EIR.

In order to develop its 2005 Urban Water Management Plan (UWMP), the City used population projections developed by the Association of Bay Area Governments (ABAG) in order to project its long-term water supply needs.

This Study uses the General Plan projections, to estimate both wastewater flows generated by the City and potential demand for recycled water within the Study Area. This planning horizon was selected in order to be consistent with the IRWP Master Plan and EIR. An Urban Reuse Project for Cotati that is consistent with the IRWP Master Plan and EIR could use this well developed programmatic overview as a basis for its own CEQA documents.

The potential recycled water use identified in this Study was compared against the 2030 water demands developed in the City's UWMP in order to understand the water supply benefits provided by recycled water.

Unit Convention

Like many agencies, the City describes its water supply and water demands in terms of acre-feet (AF) and its wastewater flows and wastewater capacity in terms of million gallons (MG). There are approximately 3 AF in 1 MG. The IRWP uses a unit convention of MG and that convention is employed in this Feasibility Study. When discussing water supply, this Feasibility Study provides conversions from AF to MG to assist the reader in relating the MG-unit to the AF-unit more typically employed in the water supply planning documents.

1.3 Land Use, Population and Utility System Demand Trends

Land Use

The City is among the smallest of Sonoma County's nine incorporated cities. With an estimated 2005 population of 7,337, the City's planning documents emphasize preservation of its rural environment while providing the incorporated area with necessary urban amenities. The planning documents also reflect the City's desire to remain a distinct small town while accepting the reality of being surrounded by larger neighbors.

The City has a voter approved Urban Growth Boundary (UGB), which extends beyond its city limits, however its current General Plan does not provide direction on where annexations may occur. The City has begun the process of updating this General Plan and as noted above, ABAG projections are used to provide indications of long term population trends.

The City has a traditional downtown, focused on a town square, known as "The Hub". The City provides a wide variety of residential land uses, generally located east of Highway 101. The City's downtown area, also located east of Highway 101, includes smaller commercial enterprises. The areas west of Highway 101 include the majority of the City's larger commercial and industrial land uses.

Population and Utility System Capacities – Current and Projected

With the development pace estimated by AGAB, population within the UGB is expected to reach a total of 8,500 by 2030. This represents a slower rate of growth than outlined in the General Plan, which estimated a total population of 8,097 within the City limits by 2010

Table 1-1 relates the population projections to both the water demand and wastewater disposal demands under current conditions, and at the 2020 and 2030 planning scenarios evaluated in the 2005 UWMP.

The water demands in Table 1-1 are the Gross Water Demands developed by the City in Table 6-3 of its UWMP. The effects of planned water conservation will be described in Chapter 3.

Table 1-1: Current and Projected Population and Utility System Capacities[1]

	2005 Estimates	2020 Estimates	2030 Estimates
Population	7,337	8,100	8,500
Potable Water Demand			
AFY	1,271	1,628	1,743
MGY	414	530	568
MGD	1.13	1.45	1.56
Recycled Water Demand			
AFY	0	To Be Determined by this Study	
MGY	0		
MGD	0		
Wastewater Flows (Average Dry Weather Flows)			
MGY	234	277	N/A
MGD	0.64	0.76	N/A

1.4 Climatic and Hydrologic Features

The City is located in the Russian River watershed. The climate and hydrology of the Russian River watershed directly affect the City because its primary wholesale supply from the Sonoma County Water Agency (Agency) is drawn from the Russian River. The climate of the Russian River watershed is tempered by its proximity to the Pacific Ocean and is characterized by seasonal rainfall patterns. Approximately 96 percent of the total annual precipitation falls between October and April. Winters are cool and below freezing temperatures occur occasionally. Summers are warm and frost free. Average annual precipitation is approximately 25 inches.[2]

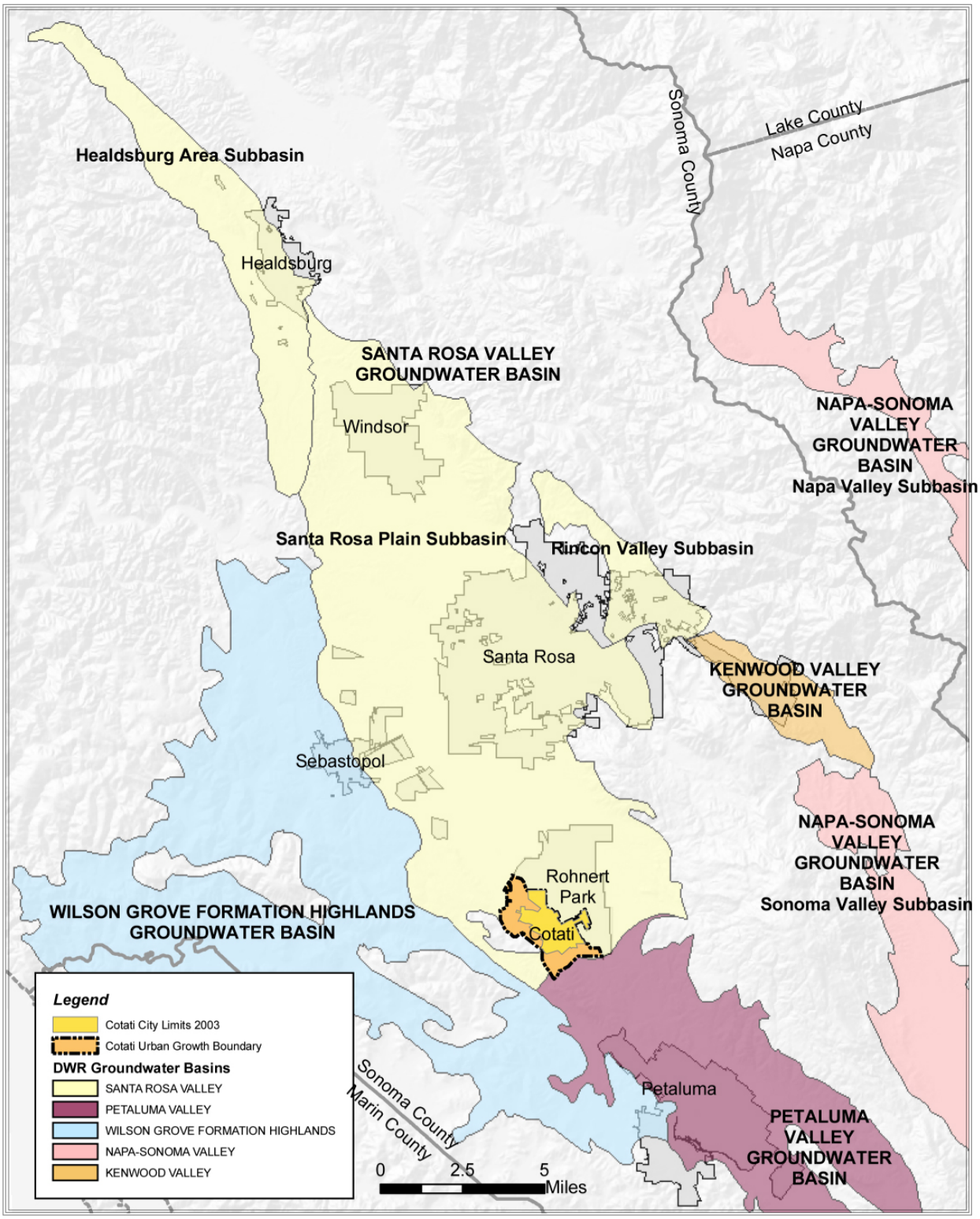
The City is located in the Santa Rosa Valley Groundwater Basin and overlays the Santa Rosa Plain Subbasin.[3] The Santa Rosa Valley Groundwater Basin is located within the Russian River watershed and subject to the same climatic features described above. Figure 1-2 illustrates the Study Area in the context of the major hydrologic features in the area.

1 Sources include Incremental Recycled Water Program Recycled Water Master Plan (February 2004) and 2005 Urban Water Management Plan, City of Cotati.

2 2005 Urban Water Management Plan 2000, City of Cotati.

3 DWR Bulletin 118

Figure 1-2: Major Hydrologic Features



Chapter 2 Wastewater Facilities, Flows and Reuse

2.1 Introduction

The Project could provide both wastewater disposal and water supply benefits; as such this chapter provides background information on regional wastewater facilities, disposal and reuse. While the City has not requested additional wastewater disposal capacity within the IRWP, other Subregional System member agencies, such as the cities of Santa Rosa and Rohnert Park, may fund expansions to the Subregional System in order to provide adequate wastewater disposal capacity for implementation of their respective General Plans. Thus, wastewater disposal benefits could be important to the Subregional System even if the City would not immediately experience them.

Cost projections are developed on a per million gallon basis assuming that capital costs are financed at a 5% interest rate for a 30 year term.

2.2 Wastewater Facilities

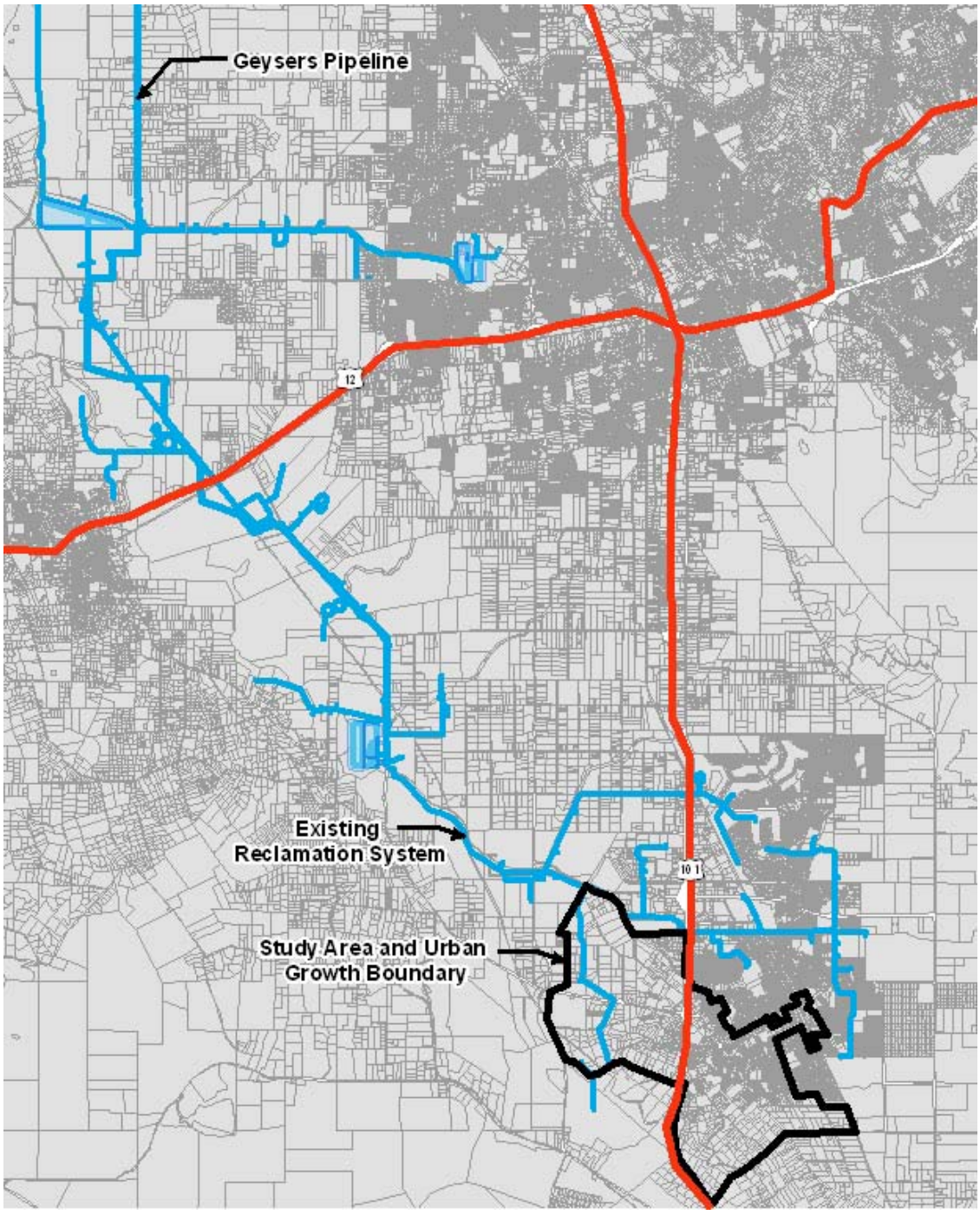
The Subregional System manages two tertiary-level water recycling plants, the Laguna Water Reclamation Plant (WRP) and the Oakmont WRP. The Oakmont WRP is operated seasonally solely to provide recycled water in eastern Santa Rosa; community of Oakmont; its recycled water distribution system is not connected to the larger Subregional System recycled water system.

The Laguna WRP is the water recycling plant serving the Subregional System. The Subregional System provides wastewater treatment, disposal and reuse services for the City and Rohnert Park, Santa Rosa, Sebastopol and the South Park Sanitation District. The Subregional System's facilities have a rated dry weather capacity of 21.3 MGD and the City is allotted 0.76 million gallons per day (MGD) of the total capacity. The Subregional System facilities are illustrated in Figure 2-1 and include:

- The Laguna WRP, a tertiary wastewater treatment plant that utilizes aeration, clarification, conventional filtration, and ultraviolet disinfection;
- A permitted wet weather discharge to the Russian River of up to 5 percent of the River flow under the NPDES Permit CA 0022764;
- The forty-mile long Geysers Pipeline that delivers 11 MGD of recycled water, year round, to the Geysers Steamfield; and
- Approximately 62 miles of recycled water distribution piping that deliver recycled water to approximately 675 sites for agricultural reuse and impoundment and approximately 100

sites for urban reuse, largely in the cities of Rohnert Park and Santa Rosa. [4] This recycled water distribution system includes approximately 1,480 MG of storage[5] in open ponds.

Figure 2-1: Subregional System Facilities



[4] Engineering Report for Master Recycling Permit for the City of Santa Rosa Water Reclamation System, September 2004.

[5] Santa Rosa Incremental Recycled Water Program, Technical Memorandum No. 16 – Water Balance Modeling Summary

2.3 The Incremental Recycled Water Program (IRWP)[6]

In November 2003, the City of Santa Rosa certified the IRWP EIR and in March 2004 adopted the IRWP Master Plan. The purpose of the IRWP Master Plan is to outline a range of programs for managing additional wastewater flows and for managing current and future flows that are discharged to the Russian River and subject to new regulations including the California Toxics Rule. The maximum flow to be managed is 6,700 MGY.

The IRWP Master Plan Selected Program (the Selected Program) is a combination of alternatives that could manage future flows and regulatory issues. The Selected Program Alternatives include:

- Indoor Water Conservation
- Urban Reuse
- Discharge
- Agricultural Reuse
- Geysers Expansion

The Selected Program is intended to be flexible and alternatives could be combined and/or implemented incrementally to provide flexibility. When the IRWP Master Plan was approved, the City of Santa Rosa established a target and a range for each alternative within the Selected Program. These are presented in Table 2-1 below. The Selected Program envisioned that 4,500 MGY would be managed by the Discharge Alternative and that a combination of Indoor Water Conservation, Urban Reuse, Agricultural Reuse and Geysers Expansion would accommodate the additional flow volume of 2,200 MGY (6,700 MGY-4,500 MGY = 2,200 MGY). The IRWP Master Plan may be updated from time to time in order to provide updated technical information on the implementation of the selected program.

Table 2-1: IRWP Master Plan Selected Program Alternative Targets and Ranges

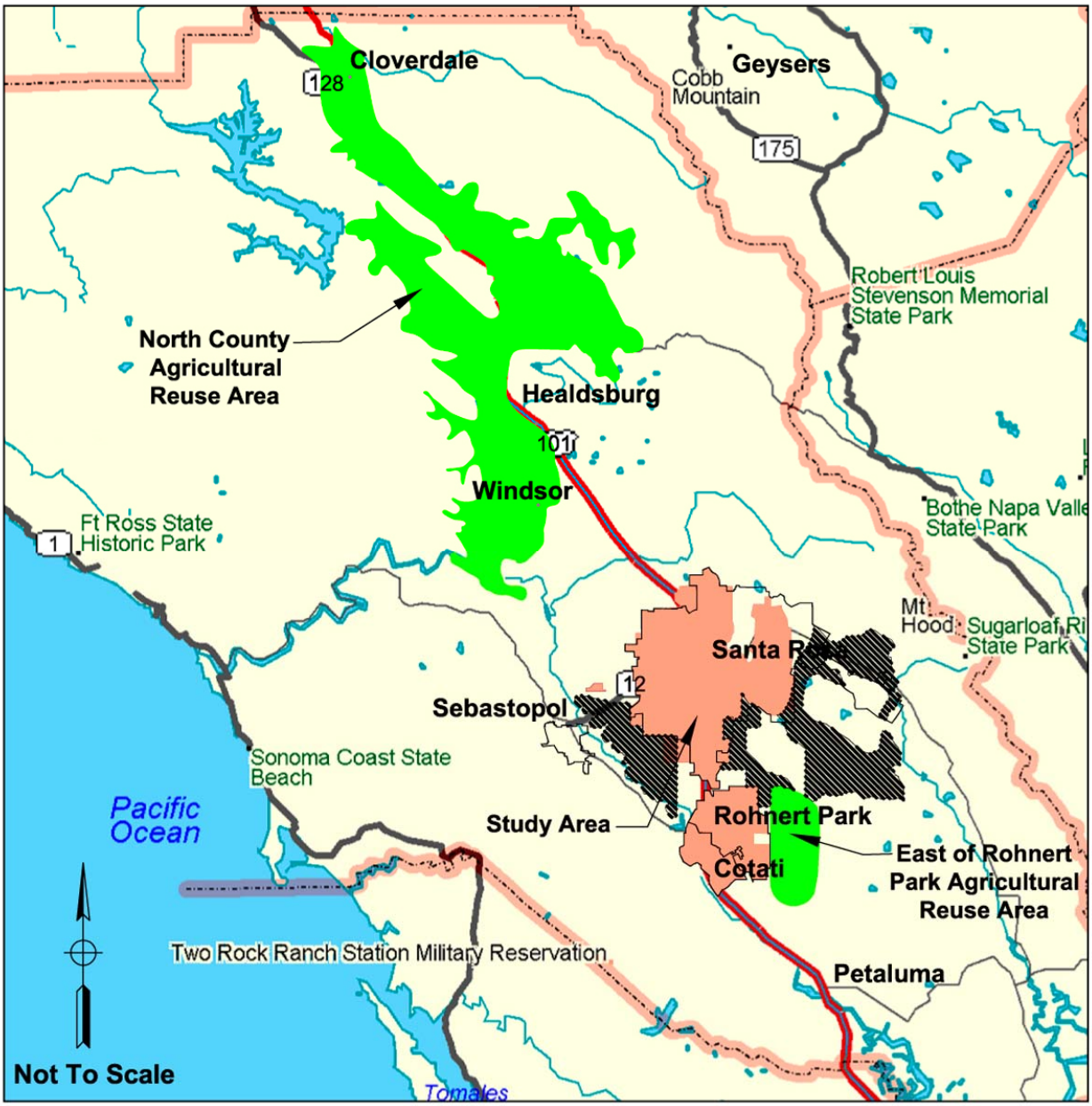
Program Element	Target (MGY)	Range (MGY)
Indoor Water Conservation	300	150 to 300
Urban Reuse	500	0 to 2,200
Agricultural Reuse	1,000	0 to 2,200
Geysers Expansion	400	0 to 2,200
Program Totals	**2,200**	**NA**

The Indoor Water Conservation Alternative is discussed in the context of the City's overall water supply in Chapter 3 Water Supply Facilities and Programs. The Urban Reuse Alternative is the subject of this Study. The remaining IRWP Program Elements are described briefly below.

Agricultural Reuse: The IRWP Master Plan identified two major areas for agricultural reuse, the North County Agricultural Reuse Area and the East of Rohnert Park Agricultural Reuse Area. These areas are illustrated in Figure 2-2.

6 Incremental Recycled Water Program Recycled Water Master Plan, February 2004.

Figure 2-2: Agricultural Reuse Areas Described in the IRWP



Up to 5,080 MG could be managed using the identified sites, although the IRWP Master Plan has limited Agricultural Reuse to a maximum of 2,200 MG annually. To expand Agricultural Reuse, the Subregional System would need to expand its network of recycled water storage ponds because it must store winter flows to have enough recycled water available to meet additional irrigation system demands. The IRWP Master Plan included a water balance model for the Subregional System that defined the additional storage necessary for each new irrigation use. This model indicates that for each gallon of irrigation demand added to the recycled water system, the Subregional System would need to construct 0.625 gallons of storage and this modeling assumption is used for planning purposes. For example, if an increment of

Agricultural Reuse in North Sonoma County would serve 370 MG of demand, it also includes the construction of 230 MG of storage (0.625 x 370 million = 230 million).

East of Rohnert Park Agricultural Reuse, as developed in the IRWP Master Plan, included three distinct increments with a total capacity of 1,600 MG. North County Agricultural Reuse, as developed in the IRWP Master Plan, included four distinct increments with a total capacity of 3,480 MGY. The costs for Agricultural Reuse developed in the IRWP Master Plan are presented in Table 2-2.

Table 2-2: Summary of Cost Estimates for Agricultural Reuse

	Agricultural Reuse East of Rohnert Park			Agricultural Reuse in North Sonoma County			
	Increment 1	**Increment 2**	**Increment 3**	**Increment 1**	**Increment 2**	**Increment 3**	**Increment 4**
Disposal Capacity Provided	440 MG	377 MG	783 MG	370 MG	170 MG	240 MG	2,700 MG
New Storage Required	275 MG	235 MG	490 MG	230 MG	106 MG	150 MG	1,690 MG
Total Estimated Capital Cost[7]	$23.5 mil	$23.0 mil	$42.7 mil	$25.4 mil	$11.7 mil	$15.7 mil	$127.4 mil
Estimated Operational Cost	$577,000	$526,000	$1,156,000	$747,000	$362,000	$463,000	$8,245,000
Year of Estimate	2004	2004	2004	2004	2004	2004	2004
ENR CCI for Year of Estimate	7,115	7,115	7,115	7,115	7,115	7,115	7,115
ENR CCI Base for this Study	7,400	7,400	7,400	7,400	7,400	7,400	7,400
Escalated Capital Cost	$24.4 mil	$23.9 mil	$44.4 mil	$26.5 mil	$12.2 mil	$16.3 mil	$132.2 mil
Escalated Operational Costs	$600,100	$547,100	$1,202,300	$776,900	$376,500	$481,500	$8,575,300
Cost per MG	$4,977	$5,579	$5,225	$6,763	$6,874	$6,429	$6,362

Geysers Expansion: The Geysers Recharge Project is a system of pump stations and pipelines that conveys recycled water from the Llano Pump Station at the Laguna WRP to the Geysers Steamfield. The system includes two sections: the Valley Section and the Mountain Section. The Valley Section, which extends from the Laguna WRP to the Bear Canyon Pump Station, includes a 48-inch-diameter section and a 30-inch-diameter section of pipeline. The Valley Section can deliver water to locations along the pipeline route. The Mountain Section extends from the Bear Canyon Pump Station to the terminal tank at the Geysers Steamfield. This pipeline section includes a 30-inch-diameter pipe and three pump stations (Bear Canyon, Mayacamas, and Pine Flat).

[7] Total costs include costs of Irrigation Systems (See IRWP Recycled Water Master Plan Table 4) and costs of Storage (See IRWP Recycled Water Master Plan Table 7).

The IRWP Master Plan developed three flow expansion increments. These were 16, 19, and 25 MGD. The maximum expansion would manage up to 6,400 MG of flow. The Selected Program limited Geysers Expansion to a maximum of 2,200 MGY or the equivalent of 17 MGD. This analysis looks only at the first two incremental expansions (15 and 19 MGD), which would provide for the future capacity needs of the Subregional System.

Table 2-3, below summarizes the estimated capital and operational costs for Geysers Expansion. The operational costs have been reduced by 25 percent from the costs presented in the IRWP Master Plan. This reduction was made at the request of the Subregional System to reflect the expected cost-sharing structure with the Geysers customer.

Table 2-3: Summary of Cost Estimates for Geysers Expansion

	Expansion to 15 MGD	15 to 19 MGD Expansion
Disposal Capacity Provided	1,460 MGY	2,200 MGY
Estimated Capital Cost	$13,100,000	$19,929,000
Estimated Operational Cost	$1,698,600	$1,812,900
Year of Estimate	2004	2004
ENR CCI for Year of Estimate	7,115	7,115
ENR CCI Base for this Study	7,400	7,400
Escalated Capital Cost	$13,591,500	$20,727,300
Escalated Operational Costs	$1,766,600	$1,885,500
Cost per MG	$1,816	$2,215

Chapter 3 Water Supply Facilities and Programs

3.1 Introduction

The Project could provide both wastewater disposal and water supply benefits; as such this chapter provides background information on regional water supply resources. The City's UWMP indicates that recycled water could provide a beneficial water source, particularly late in the UWMP planning period.

Similar to Chapter 2, cost projections are developed on a per million gallon basis assuming that capital costs are financed at a 5% interest rate for a 30 year term. This parallel cost development will provide a framework to allocate a portion of the costs of an urban reuse project to water supply benefits and a portion to wastewater disposal benefits.

3.2 Water Supply – Current and Projected

The City currently utilizes two sources for water supply and manages an active water conservation program. Water is supplied by the Sonoma County Water Agency (Agency) and from City wells (groundwater). While the City has historically used groundwater to supply more than half of its demands, its current water management strategy is to draw its primary water supply from the Agency and utilize groundwater to supplement its needs during peak demand periods or periods of drought. Table 3-1 summarizes the water supply currently available and planned to be available to the City. According to the City's UWMP, the 2020 and 2030 water supply is approximately equal to demand.

Table 3-1: Current and Planned Water Supply from Various Sources

	2005	2020	2030
Sonoma County Water Agency (1)			
AFY	1,069	1,339	1,489
MGY	348	436	485
Local Groundwater (1)			
AFY	49	172	90
MGY	16	56	29
Recycled Water (2)			
AFY	0	0	33
MGY	0	0	11
Conserved Water (3)			
AFY	0	117	131
MGY	0	38	43
Totals			
AFY	1,118	1,628	1,743
MGY	364	530	568

(1) Based on City of Cotati 2005 UWMP, Table 7-1.

(2) Based on City estimates. The proposed volume of urban reuse and timing of urban reuse implementation may be refined by the study.

(3) Based on City of Cotati 2005 UWMP, Table 6-4. Water Conservation is brought forward in the supply calculations in order to facilitate economic comparisons.

3.3 Sonoma County Water Agency Supply

The Agency provides wholesale water service from its Russian River System to eight prime contractors (the cities of Santa Rosa, Rohnert Park, Cotati, Petaluma and Sonoma; the Town of Windsor; North Marin Water District and Valley of the Moon Water District, hereinafter the Contractors) under the Restructured Agreement for Water Supply (Restructured Agreement), and to other customers under individual governing agreements.

The Russian River System includes Lake Mendocino, Lake Sonoma, six Raney collectors and seven conventional wells located in the gravels of the Russian River, at Wohler and Mirabel near Forestville. The Raney collectors and wells divert river underflow for potable supply. Lake Sonoma and Lake Mendocino provide primary diversions for the Russian River system and their combined storage for water supply is in excess of 300,000 AF (97,750 MG). The Agency currently has rights to divert and re-divert up to 75,000 AFY (24,438 MGY) from the Russian River System. In 1998, the Agency completed an EIR for its Water Supply and Transmission System Project (WSTSP) to increase these diversion rights up to 101,000 AFY (32,911 MGY) and to construct improvements to its transmission and storage system. In 2003, as a result of challenges and an eventual decision by the Court of Appeals, the Agency vacated certification of this EIR. The status of proposed improvements to the Agency's supply is discussed in this section under the subheading, Planned Improvements to the Agency Water Supply.

Agreements for Agency Water Supply and Transmission Capacity

The Agency and the Contractors currently operate under the Restructured Agreement. The Restructured Agreement defines how water is allocated among the Contractors. Section 3.5 of the Restructured Agreement also defines how water supply and transmission system capacity would be allocated in case of shortage. The City is entitled to 1,520 AFY (495 MGY), with a maximum monthly average delivery rate of 3.8 MGD under the Restructured Agreement.

The Restructured Agreement also provides for additional investments in alternative water supplies (conservation and recycling) and in watershed restoration activities to benefit the Russian River System.

Because the Agency has been unable to construct certain upgrades to its transmission system that allow it to meet peak demands, the Memorandum of Understanding Regarding Water Transmission System Capacity Allocation during Temporary Impairment (the Temporary Impairment MOU) was executed on March 1, 2001 and renewed on June 20, 2006. The Temporary Impairment MOU outlines each Contractor's allocation of transmission system capacity during the peak usage periods of June through September through 2008. The City's maximum monthly average delivery rate under the Temporary Impairment MOU is 1.9 MGD. The Temporary Impairment MOU affects only transmission system capacity and in no way modifies the City's annual volume entitlement of 1,520 AF.

Planned Improvements to the Agency Water Supply [8]

In May 2004, the Agency released a Notice of Preparation (NOP) of a Supplemental EIR for the Water Supply and Transmission System Project (WSTSP): Litigation, Project Updates, Changes in Circumstances and New Information. Based on comments received in response to the NOP and events that have occurred since the WSTSP was approved in 1998, Agency staff recommended to its Board of Directors that the Agency prepare a new EIR to provide the public and decision-makers with an environmental document that not only addresses the deficiencies identified by the Court of Appeals, but also more closely reflects the Agency's and its customers' current water supply circumstances. In November 2004, the Agency's Board adopted a resolution directing the preparation of a new EIR, called the Water Supply, Transmission, and Reliability Project EIR (the Water Project EIR). In February 2005, the Agency released an NOP for the Water Project EIR.

The objective of the Water Project remains similar to the objective of the WSTSP—to provide a reliable water supply to meet the defined current and future needs in the Agency's service area. Because the Water Project EIR is not yet available, this analysis assumes that, at least for the purpose of estimating future costs, the planned improvements will be similar to those identified in the WSTSP EIR. These are described briefly below. Table 3-2 presents the estimated future costs.

Russian River Component: The Russian River Component is likely to include increased diversions from the Russian River and a new permit from the State Water Resources Control Board to allow the increased diversions. The Agency has considered several diversion strategies and at least two capacity options.

New conventional wells or Raney Collectors, which divert water from underflow of the Russian River, are referred to as Aquifer Diversion. Costs for Aquifer Diversion have been estimated for a maximum capacity of 26,000 AFY (8,470 MGY) which is the amount necessary to support a Water Right Increase from 75,000 AFY to 101,000 AFY.

A new Surface Water Treatment Plant (SWT) is another mechanism to support increased diversions. Costs for a SWT have been developed for two capacity sizes 57 MGD and 120 MGD. Both facilities support 26,000 AFY in new diversions. The larger capacity SWT would allow the Agency to reduce diversions through its Raney Collectors and wells by increasing diversions through the SWT.

Transmission System Component: The Transmission System Component is likely to include improvements to transmission pipelines, storage tanks, and pumping facilities. The Transmission System Component has been estimated for a maximum additional capacity of 26,000 AFY including allowances for maximum pumping rates.

[8] Sonoma County Water Agency, Diversion Alternatives Status Update.

Table 3-2: Summary of Cost Estimates for Planned Improvements to Agency Supply[9]

	Project Component			
	Russian River Component			Transmission System Component
	Aquifer Diversion	Surface Water Treatment 1 (57 MGD)	Surface Water Treatment 2 (120 MGD)	
Supply Delivered				
AFY	26,000	26,000	75,000	26,000
MGY	8,470	8,470	24,400	8,470
Estimated Capital Cost	$40 to $70 million	$175 to $225 million	$275 -$375 million	$130 to $140 million
Estimated Operational Cost	$2.9 to $3.0 million	$6.2 to $8.3 million	$9.6 to $14.9 million	Included with supply
Year of Estimate	2001	2001	2001	2001
ENR CCI for Year of Estimate	6,343	6,343	6,343	6,343
ENR CCI Base for this Study	7,400	7,400	7,400	7,400
Escalated Capital Cost	$47 to $82 million	$204 to $262 million	$321 to $438 million	$152 to $163 million
Escalated Operational Costs	$3.4 to $3.5 million	$7.2 to $9.7 million	$11.2 to $17.4 million	Included with supply
Cost per MG	$2,295	$4,414	$6,228	Included with supply

3.4 Local Groundwater Supply

As noted above, the City modified its water supply management strategy in the 1990s in order to increase its use of Agency supply and utilize its groundwater supply to meet peak demands and for emergency situations. The City is not planning to expand its local groundwater well network. Investments in the groundwater supply system will be to support continued use of the current capacity and not to provide new capacity to the system.

3.5 Water Conservation

The City's 2005 UWMP provides the most current assessment of measurable reduction in water use due to water conservation from implementation of the California Urban Water Conservation Council's Best Management Practices (BMPs). The 2005 UWMP also provides an analysis of additional conservation activities, beyond the fourteen BMPs. The IRWP, described in Chapter 2, projects a 450-1,000 AFY (150-300 MGY) level of indoor water conservation, by 2020, as part of an overall strategy to manage wastewater flows.

As the managing partner and largest contributor to the Subregional System, Santa Rosa has been working to implement water conservation strategies since the mid-1990s. This experience provides Santa Rosa with a significant database in order to analyze the effectiveness and cost of various conservation programs. Based on the cost of its most recent water conservation efforts, Santa Rosa anticipates that an initial capital investment of approximately $9,000/AF is required. Annual operating costs are estimated at $100/AF. These costs are carried forward into Table 3-3

[9] Sonoma County Water Agency, Diversion Alternatives Study Update

in order to provide the City with an estimate of long term budgetary cost of Water Conservation and in order to provide for economic comparisons between the various water supply strategies.

Table 3-3: Summary of Cost Estimates for Planned Water Conservation

Supply Delivered	
AFY	131
MGY	43
Estimated Capital Cost	$1,179,000
Estimated Operational Cost	$13,100
Year of Estimate	2005
ENR CCI for Year of Estimate	7,400
ENR CCI Base for this Study	7,400
Cost per MG	$2,088

3.6 Recycled Water

The Subregional System's current facilities deliver recycled water to the Rohnert Park Urban Reuse system, directly north and east of the City, to Gallo Vineyards south of the City and to one irrigation customer on West Sierra Avenue, outside of the City limits but within its UGB.

As noted in Chapter 2, the IRWP Master Plan included urban reuse in Cotati within its Alternative 3. Since the completion of the IRWP Master Plan, the City of Sana Rosa has developed a Feasibility Study of urban reuse with its Urban Growth Boundary and documented a four-phase urban reuse project. As part of implementing the IRWP Master Plan, the Subregional system has requested that the City of Cotati provide information on the amount of recycled water it would like to use pursuant to the Subregional System Agreement. This document will analyze the potential for recycled water use in Cotati in order to assist the City with its water supply planning and to inform its response to the Subregional System.

Chapter 4 Market Assessment

4.1 Introduction

This chapter describes the methodology used to identify potential recycled water customers and quantifies the recycled water market in the City. Specifically, this chapter:

- Identifies potential recycled water customers and organizes those customers in a manner that facilitates decision making;
- Quantifies potential demand for recycled water in annual totals by customer class and size.

4.2 Identification & Classification of Potential Customers

Potential recycled water customers were identified through the use of a GIS database (the Demand Database) that includes all the irrigation meters in the City, their location expressed by both site address and assessor parcel number, historic water demands based on City billing records and estimated water budgets, when these were available.

To analyze discrete market segments and assist the City in making decisions related to future service, potential customers were classified using criteria related to water use patterns and potential customer service needs. These criteria are described below.

Potable Offset Potential

The Market Assessment focused on potential recycled water customers that offset potable water demand (i.e. reduce demand for potable water supply). The City's water utility will receive benefit from an urban reuse project that provides recycled water to offset and supplement potable water, thus creating a new supply of potable water. Potable offset customers were identified by focusing on the City's customers with dedicated irrigation meters.

This exercise identified 109 potential recycled water customers with a total potable offset of 52.4 MGY (approximately 161 AFY). The City's UWMP identifies recycled water deliveries of approximately 10 MGY (30 AFY) which is just under 20% of the total market.

Customer Organization & Decision Structure

Effective management of the recycled water resource, especially by irrigation users, requires an ongoing dialogue between the recycled water supplier and the end user. To assure the most effective systems are put in place to guarantee this dialogue, the Market Assessment distinguishes irrigation users based on the customers' organization including internal decision structures, information needs and need for ongoing programmatic support.

Commercial/Industrial Landscapes

Commercial and Industrial (C/I) landscapes are typically managed professionally, which could provide the City with a ready point of contact that could serve as Site Supervisor to assist in implementing recycled water program requirements. While these landscapes are typically open to the public, the level of public access is frequently low as the landscape is often intended as an

aesthetic enhancement rather than a recreational amenity (private golf courses would be an exception). In compliance with City policy, most of these customers have dedicated landscape meters, meaning that the irrigation system is already separated from the domestic water system which facilitates conversion to recycled water. Rate incentives could be an effective tool for this class of customer.

The Demand Database includes 56 C/I customers with a total demand of 10.5 MGY, or approximately 20% of the total market. The C/I customers are concentrated in the areas of the City west of Highway 101. For the purposes of this study, C/I customers are illustrated in red.

Public/Institutional Landscapes

Public and Institutional (P/I) accounts include parks, schools, government complexes, and publicly maintained landscaped open areas. Like commercial and industrial landscapes, these landscapes are typically professionally managed and often plumbed with a dedicated irrigation meter.

Unlike commercial and industrial landscapes, P/I landscapes often have high public access and contain recreational amenities. Therefore, the managers of P/I landscapes must often consider the opinions of their customers when making decisions regarding conversion to recycled water. As such, their decisions could be directed by general public opinion as much as by incentives.

The Demand Database includes 25 P/I customers with a total demand of 26 MGY, or approximately 50% of the total market. The majority of the P/I uses are concentrated on or just beyond The Hub. For the purposes of this study, P/I customers are illustrated in green.

Residential Common Areas

This class includes the common areas associated with apartment complexes, condominium complexes, mobile home parks, and single-family residential developments, with common areas maintained by homeowners' associations. While often professionally managed, decisions about these landscapes typically rest with or could be highly influenced by the residents. As such, regular communication channels could be more challenging to establish because decision-making is more diversified.

This class of customer often requires much more outreach and education regarding recycled water quality and safety to become comfortable with the use of recycled water. However there are many successful examples of recycled water use in residential settings.

The Demand Database includes 28 Residential customers with a total demand of 16 MGY, or approximately 30% of the total market. For the purposes of this study, Residential customers are illustrated in blue.

Customer Size

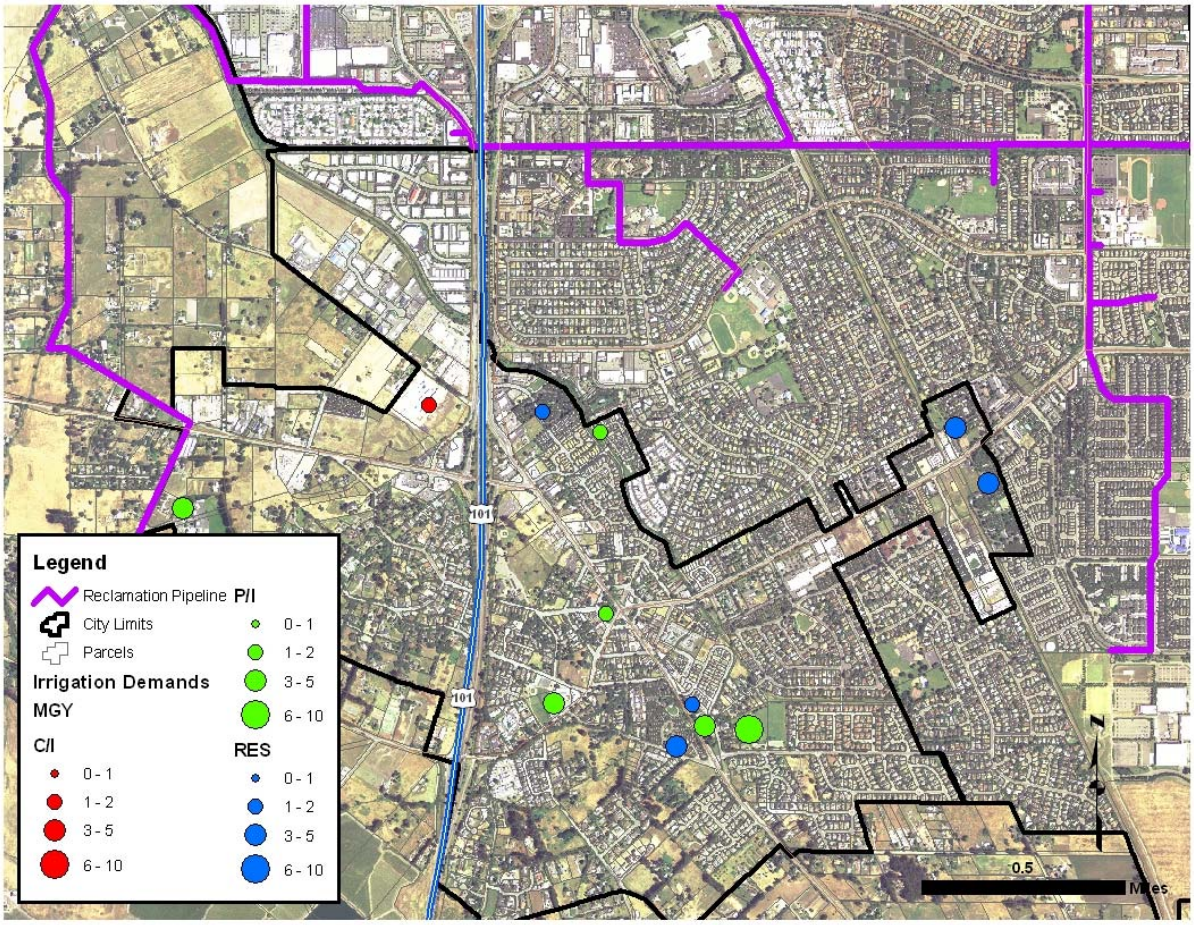
When a recycled water distribution system is developed in an existing urbanized area, it is highly unlikely that all the identified customers would be connected to the system at once. Pipeline extensions to serve small, remote customers are very expensive and requirements for site supervision and monitoring are far more efficient when they can be focused on relatively large customers, or customers in tight clusters, rather than upon multiple, scattered, small customers.

For the purpose of analyzing the "efficiency" of alternative recycled water systems, customers were classified by size, as described below. Large Customers and Large Groups of customers can "anchor" a recycled water distribution system and justify the economic decision to extend the system.

Large Customers

For the purpose of this analysis, a "Large Customer" is defined as single customer with a demand of over 1.0 MGY. Figure 4-1 illustrates the large customers in the City; the color-coding convention indicates the customer classes with red being C/I, green being P/I and blue being residential common areas. There are twelve large customers in the Demand Database. Together these customers include 28 MGY of demand or nearly 60% of the system total. These customers are scattered throughout the City with the largest concentrations occurring near The Hub on P/I landscapes.

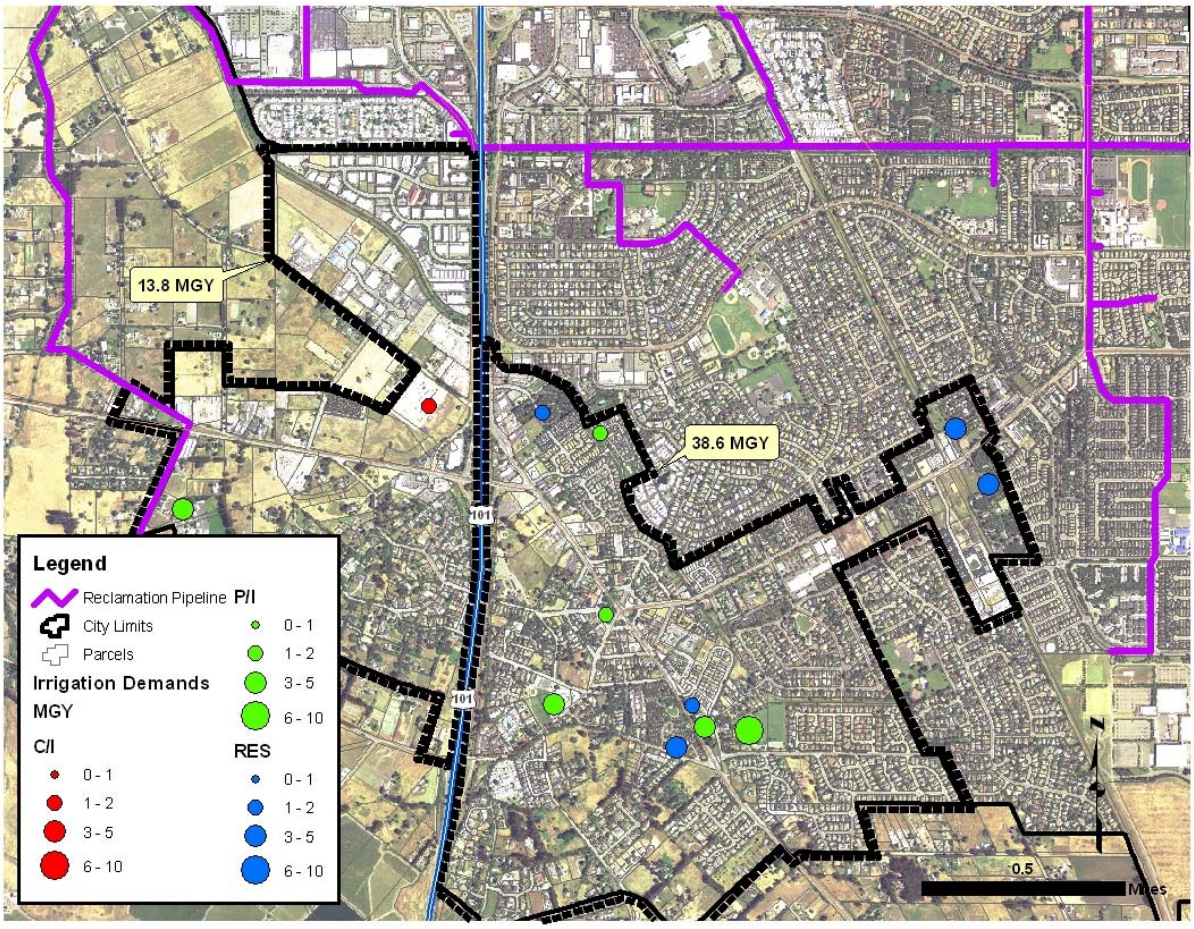
Figure 4-1: Large Customers



Groups of Customers

To assure that the recycled water distribution system could provide adequate hydraulic capacity, customers were mapped so that concentrations of customers could be recognized. Figure 4-2 illustrates the all of the potential customers and reveals, in addition to the concentration around The Hub, another significant group in the northwest portion of the City. The portion of the Study Area west of Highway 101 includes 26% of the total market and almost all the users are within one-half mile of the existing recycled water distribution system.

Figure 4-2: Customer Grouping



Chapter 5 Engineering and Cost Criteria

5.1 Introduction

This chapter describes the engineering criteria and cost assumptions that were used in developing alternatives.

5.2 Cost Estimating Accuracy

The cost estimating approach used in this Study is based on guidelines developed by the American Association of Cost Engineers (AACE). AACE has developed definitions for levels of accuracy commonly used by professional cost estimators. The AACE defined the three levels of cost estimates as *order-of-magnitude, budget,* and *definitive* estimates. The costs presented here are best characterized as order-of magnitude estimates. An order-of-magnitude estimate is made without detailed engineering data. Some examples include:

- An estimate from cost capacity curves
- An estimate using scale-up or scale-down factors
- An approximate ratio estimate

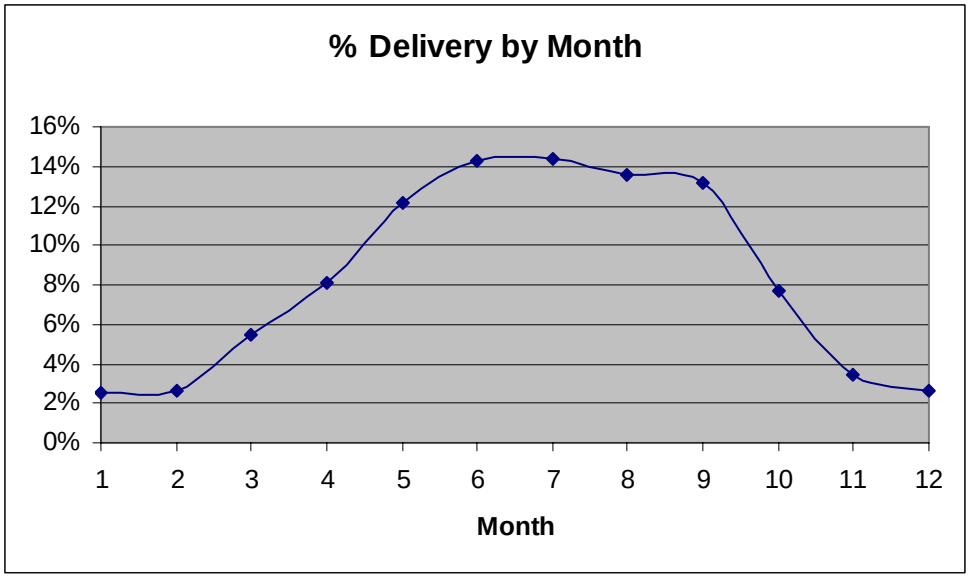
Typically, an order-of-magnitude estimate is prepared *at the end of the schematic design phase* of the design delivery process. It is normally expected that an estimate of this type would be accurate within plus 50 percent to minus 30 percent of the estimated cost.

5.3 Recycled Water Demand Factors

Recycled water demand factors were used to model the peak demands. The peak demand calculation was intended to reflect both seasonal demand variations and daily patterns of use.

The annual water use pattern for the recycled water system was brought forward from the Santa Rosa Urban Reuse Project Feasibility Study. This demand distribution was developed using the average distribution across several thousand dedicated irrigation meters in Santa Rosa, providing a solid sample upon which to base future projections. This water use pattern is illustrated in Figure 5-1.

Figure 5-1: Annual Distribution of Demand



Several alternative analytical tools were used to arrive at an estimate for peak hourly demand including review of monthly evapotranspiration data and review of specific water accounts. Each analysis performed resulted in a peak hourly demand of approximately 10 times the annual daily average demand.

For this analysis, peak hour demand was calculated as follows:

Peak Hour = (Total Annual Demand/365 Days/Year) x 10

An irrigation cycle of 6 hours was used to translate hourly values into daily values (i.e. this analysis assumed that the total daily irrigation demand is delivered in 6 hours). The peak day demand was calculated as shown below. The peak hour is 4 times the peak day.

Peak Day Demand = Peak Hour Demand x 6 hours/24 hours/day

5.4 Engineering and Cost Assumptions

The engineering and cost assumptions presented here are consistent with the Santa Rosa Urban Reuse Project Feasibility Study. The City of Santa Rosa is pursuing predesign studies for the Santa Rosa Urban Reuse Project and both engineering assumptions and cost assumptions may be modified as a result of this work.

Pipeline Sizing and Base Capital Costs

The pipeline network for the Project was sized to distribute the maximum flow expected for each reach or segment in the distribution network. The pipeline design criteria used is summarized in Table 5-1. The minimum and maximum allowable flows for each pipe size were determined based on the peak hourly low rate.

Table 5-1: Pipeline Size and Base Costs

Pipeline Size and Base Costs[1,2]								
Diameter (inches)	Roughness Coefficient (C)	Peak Flow Rate (gpm)		Low Flow		High Flow		Total Capital Costs ($/LF)
		Low	High	HL per 1,000 feet	Velocity (fps)	HL per 1,000 feet	Velocity (fps)	
6	120	Not Modeled						75
8	120	0	700	0	0	8.9	4.5	80
12	120	700	1,736	1.1	2.0	8.2	4.9	110
18	120	1,736	3,968	1.1	2.2	5.3	5	190
24	120	3,968	7,068	1.3	2.8	3.8	5	245
30	120	7,068	10,975	1.3	3.2	2.9	5	280
36	120	10,975	17,361	1.2	3.5	2.8	5.5	350
48	120	17,361	34,102	0.7	3.1	2.4	6	500

Notes:
(1) Prices are based on Engineering News Record's CCI of 7,400.
(2) Base pipeline costs are based on a review of available bid data in Sonoma County.
fps = feet per second
LF = linear feet
HL = head loss

The peak hourly flow rates were calculated by applying the Recycled Water Demand Factors, described above, to the demand data described in Chapter 4.

The pipe sizes were calculated using the Hazen-Williams Formula. Although the type of pipe can affect the friction coefficient for a pipeline, a "C" value of 120 was used for all pipelines because on a long term basis, most pipeline interiors converge on this roughness value.

The sizing of pressure pipelines was based on a combination of head loss (friction) and maximum velocity. A high head-loss rate means that extra pumping would be required. A maximum head loss of 10 feet per 1,000 feet of pipe was used for sizing the pipes.

Velocities in the smaller diameter pipes were kept to a maximum of 5 feet per second (fps) to limit forces and pressures on the pipes. As shown in Table 5-2, the maximum flow allowed in pipe sizes of 12 to 30 inches is controlled by the 5.0-fps maximum velocity. For pipes sized between 30 and 48 inches, the velocity was allowed to gradually increase from 5 to 8 fps.

Costs for pipe sizes ranging from 8 inches to 48 inches in diameter were developed through a review of recent bid data. All costs were adjusted to the CCI of 7,400. Pumping costs were not included in the pipeline costs, but were accounted for separately (see Assumptions Regarding Pump Stations and Costs, below). The capital costs include an allowance for planning, engineering (design), administration, and permitting. These costs were estimated to be 23 percent of the base construction costs.

Although the material selected for a pipeline can affect the cost of the pipeline, this factor was not considered due to the preliminary nature of this Study. Many pipe types were included in the sources and the bids, and all of these pipe types were included in the comparison. Therefore, the estimated costs tend to represent an average cost of the possible materials for each pipe's size. No land-acquisition costs are included in the base pipeline costs.

Land-Use Factors Applied to Base Capital Costs

Land use surrounding the pipeline construction corridor could have a significant impact on installation costs. Pipeline that is constructed in open areas has little or no utility interference or traffic control requirements, whereas construction in urban areas could be significantly complicated by these conditions.

The U.S. EPA published a technical report in 1978 entitled *Construction Costs for Municipal Wastewater Conveyance Systems: 1973-1977*, and then updated this report in 1982. This report includes "cultural modifiers" or multipliers for sanitary sewer construction costs based on surrounding land-use. Previous construction projects have been evaluated with these factors and this evaluation indicates that these factors are useful in developing estimates that closely parallel actual bid data and specific cost estimates prepared for pipelines representing these conditions.

For this analysis, a baseline condition, with a rural or barren land use interface, has a multiplier at 1.00. The EPA category multipliers are then normalized to this baseline condition. No land-acquisition costs are included in the urban or built-up land-use categories because of the assumption that pipelines will be routed within existing public rights-of-way. Because the GIS land uses cover a much wider range of conditions than is covered in the EPA's publications, many of the land-use multipliers have been estimated based on EPA's work and good estimating practices.

Table 5-2 shows a complete listing of the GIS land-use categories and the associated land-use multiplier. An average tunneling cost was assumed for those land uses that would typically require tunneling. Land uses that would typically require tunneling include crossings for creeks, freeways, highways, and railroads. The multiplier for these is 5.33. Areas where construction of a pipeline was considered extremely impractical, if not impossible, were given the highest multipliers of 7.50 or 10.00. A factor that is less than the base factor of 1.00 was used for areas that have been deemed to be favorable for construction of recycled water pipelines. This factor was typically applied to existing pipeline rights –of-way. Following established flood control channels was also favorable, because the land-acquisition costs can be minimal since these areas tend to be publicly owned lands or relatively open areas with minimal potential conflicts from other utility lines.

Table 5-2: Pipeline Land-Use Cost Factors

Land-Use Factors		Freeways/Highways/Railroads	
Description/Item	Norm. to Rural	Description/Item	Norm. to Rural
Urban/Built-Up Land		Freeways	
Residential	1.20	To Cross	5.33
Commercial	1.53	To Follow (Factor Times Underlying Land Use)	0.80
Industrial	1.53	To Cross Freeway Interchanges	10.00
Transportation, Communication	1.53	Highways	
Airports, Transportation Centers	10.00	To Cross	5.33
Mixed/Other Urban	1.35	To Follow (Factor Times Underlying Land Use)	0.80
Agricultural Land (all types)	1.00	Railroads	
Forest and Rangeland (all types)	1.00	To Cross Only	5.33

Land-Use Factors		Freeways/Highways/Railroads	
Description/Item	Norm. to Rural	Description/Item	Norm. to Rural
Water Bodies		Hydrography	
Wetlands	7.50	Rivers	
Creeks	5.33	To Cross	5.33
Bays and Estuaries	7.50	To Follow (Factor Times Underlying Land Use)	1.80
Lakes & Reservoirs	10.00	Creeks	
Open Space	1.00	To Cross	5.33
Unknown	1.00	To Follow (Factor Times Underlying Land Use)	1.80
Barren Lands		Existing Recycled Water Pipelines	
Dry Salt Flats	1.00	Pipelines with No Excess Capacity	0.80
Beaches	5.33	Pipelines with Excess Capacity	0.00
Sandy Areas Other Than Beaches	.75		
Bare Exposed Rock and Tundra	7.00		
Strip Mines, Quarries, and Gravel Pits	1.20		
Transitional Areas	1.20		
Mixed Barren Land	1.20		

Operations and Maintenance Costs

These costs were estimated to be approximately 0.50 percent of the actual construction costs on an annual basis.

Assumptions Regarding Pump Stations and Costs

Capital Costs

The pump station capital cost estimates included construction, engineering, planning, and administration. These costs are estimated to be approximately 23 percent of the total construction cost.

Practically, recycled water service would be provided to the City through a planned upgrade of the Rohnert Park Pump Station located near the intersection of Stony Point Road and Rohnert Park Expressway. For the purpose of this Study's estimates, pump station capital costs were based on new connected horsepower (hp) demands. The following equation was derived based on the above-mentioned sources for the construction cost of a pump station:

$$\text{Capital cost} = \$15{,}900 \times hp_{peak}^{0.68}$$

Where:

hppeak = peak brake horsepower (all users on at the same time)

$$= \frac{Q_{peak}[gpm] \times \left(\Delta Elev + h_{L-peak} + P_O\right)}{3956} \times \frac{1}{Efficiency}$$

Where:

Efficiency = 75 percent (wire to water)

Elev +hL-peak +PO = total head in pipeline segment (feet)

PO = Initial or boosting pressure

hL-peak= friction loss under peak flow rate along pipeline based on Hazen-Williams Formula

$$= \frac{10.44 \times L \times \left(\frac{Q_{peak}[AFY]}{1.6128} \right)^{1.85}}{C^{1.85} \times Diam[in]^{4.8655}}$$

Where:

L = Length of pipeline in feet

C = 120 (Hazen-Williams Coefficient for friction)

Diam = the pipe diameter in inches based on the peak flow rate

Operation and Maintenance Costs

O&M costs included labor, equipment replacement, and electrical power usage. Annual expenditures for labor and equipment replacement were based on the initial construction cost of the pump station. The following equation was used to estimate the annual O&M labor and equipment replacement costs ($O\&M_{LE}$) for each pump station:

Annual O&MLE = $10,600 + 3 percent of construction costs

Electrical costs for pumping were estimated by applying the average flow for the network over a 24-hour period of operation. Because the landscape irrigation users tend to be seasonal users and are expected to operate only about six months of the year, electrical costs for pumping were computed under peak conditions. Under the peak condition, it was assumed that all users would be using recycled water for 6 months, and electrical pumping costs were computed on that basis. Electrical costs were computed by using the following annualized equations, which were prorated for the 6-month period:

Assumed cost for electricity = $0.10/kilowatt-hour

$$\text{Annual electrical cost} = \$0.10 \times hp_{ave} \times 24hrs \times Time \times 0.7457 \frac{kw-hr}{hp}$$

Where:

Time = 6 months

hpave = the average brake horsepower

$$= \frac{Q_{avg}[gpm] \times \left(\Delta Elev + h_{L-avg} + P_O \right)}{3956} \times \frac{1}{Efficiency}$$

$$= \frac{Q_{avg}[AFY]/1.6128 \times (\Delta Elev + h_{L-avg} + P_O)}{3956} \times \frac{1}{0.75}$$

Where:

Qavg = average flow

HL-avg = friction loss along pipeline based on Hazen-Williams formula

Chapter 6 Project Alternatives

6.1 Introduction

This chapter summarizes the techniques used to analyze various alternatives for implementing a recycled water Project in the City. This chapter discusses:

- Common Recycled Water Project Components
- Alternative Recycled Water Projects
- Alternative Analysis and Recommendations

6.2 Common Recycled Water Project Components

The Subregional System has conceptually developed a range of urban reuse projects in its IRWP. In addition, Santa Rosa has been actively planning an urban reuse project within its UGB that ranges in size from up to 1,000 MGY. As a result of these activities, a range of improvements that are necessary to allow the existing Subregional System facilities to effectively deliver high quality recycled water for urban use have been identified. Because the City is located directly adjacent to the existing Rohnert Park Urban Reuse System and because its potential demands are so small compared to the overall planning effort, work performed as part of the IRWP and for the Santa Rosa Urban Reuse Project provide important information regarding the baseline improvements that will be necessary to allow the existing facilities to effectively serve expanded urban reuse in Cotati.

Recycled Water Source Improvements

The Subregional System distributes recycled water produced by the Laguna WRP to the reclamation system storage ponds and distribution piping (where it is used for agricultural or urban reuse), and to the Geysers Pipeline (GPL). The Subregional System's Rohnert Park Urban Reuse System begins at the intersection of Stony Point Road and Rohnert Park Expressway. Recycled water from the Laguna WRP is delivered through an 18-inch-diameter low-pressure distribution system that dead-ends at the Fox Tail Golf Course (the low-pressure system) and the high-pressure system that includes the Poncia Pump Station, screen filters, and a 24-inch-diameter transmission main that extends along Copeland Creek to Snyder Lane; from here a 14-inch diameter main continues to Sonoma State University. The high pressure system also provides seasonal deliveries to the Gallo Vineyard utilizing an 18-inch pipeline along the City's western limit (see Figure 6-1).

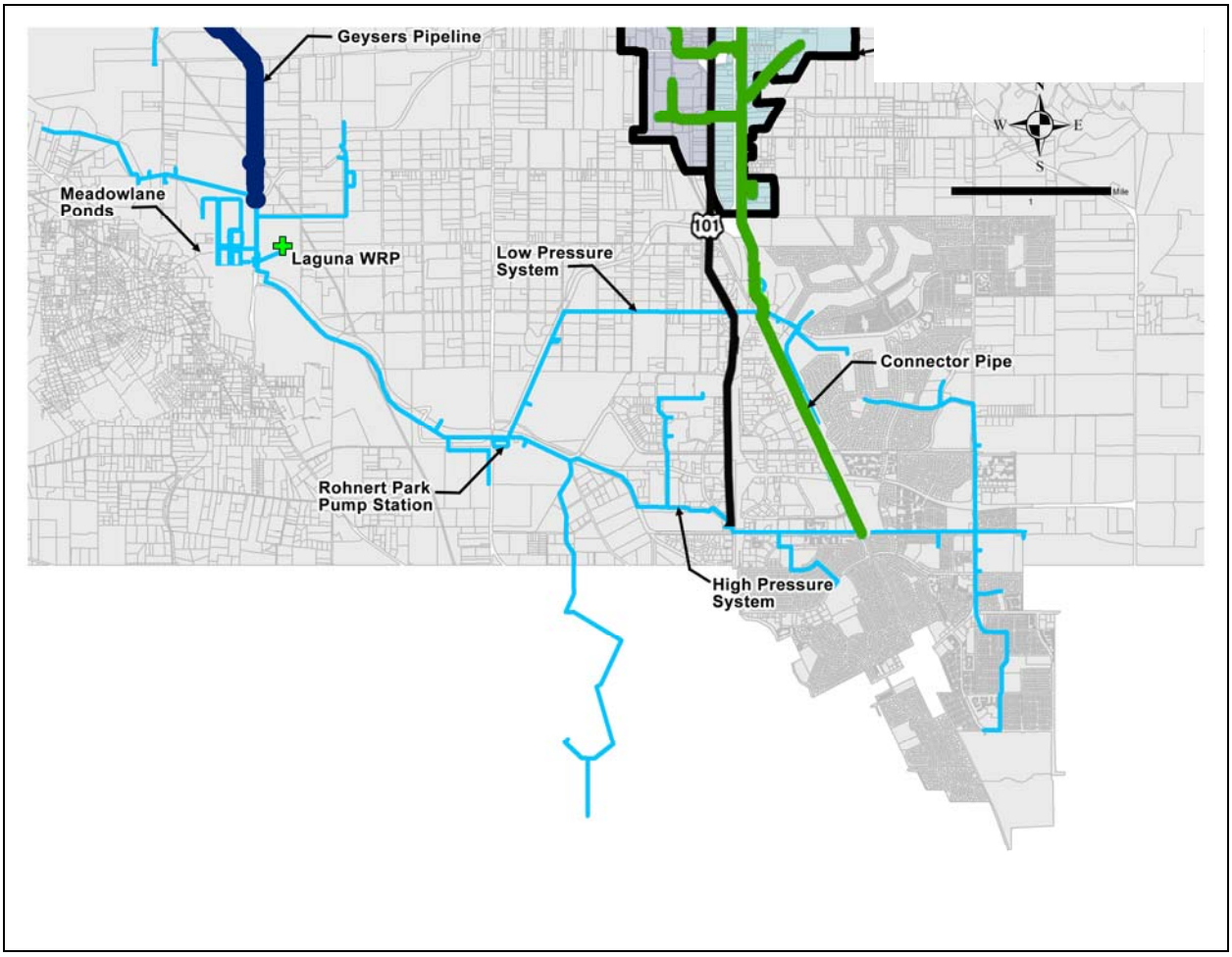
Capacity Determination

An analysis of the existing Rohnert Park Urban Reuse System was performed using H2ONet and is included in Appendix 1. The conclusion was that from 3,000 to 7,000 gpm (approximately 4 to 10 MGD) could be supplied through the existing low and high pressure systems to Cotati. This flow is time dependent, because there are existing users on the Rohnert Park Urban Reuse System.

The overall system would be maximized by adding a 7,700 ft connector pipe, and a between the low-pressure and high-pressure systems, and a diurnal storage tank as indicated on Figure 6-1. This would maximize the ability to serve new recycled water users in Rohnert Park, south Santa Rosa and/or the City. The existing hydraulic capacity of the Rohnert Park Urban Reuse System, coupled with current demands on this system, effectively limits the new capacity that can be developed through the Rohnert Park Urban Reuse System to 1,000 MGY, which is sufficient to serve the demands identified for Rohnert Park and the City in the IRWP Master Plan and over one-half of the Santa Rosa Urban Reuse System as outlined in the Santa Rosa Urban Reuse Feasibility Study. The recycled water source improvements, described below, are estimated assuming 1,000 MGY of capacity will ultimately by developed.

Additionally, the Subregional System would undertake a planned expansion of the Rohnert Park Pump Station to install additional pumping capacity.

Figure 6-1: Rohnert Park Source Improvements



Polishing Treatment

As noted in Chapter 2, The Laguna WRP is a tertiary treatment plant with a rated capacity of 21.3 MGD. The current average dry weather flow of the plant is approximately 16 MGD. The Geysers Steamfield utilizes a constant 11 MGD, leaving 5 MGD of "fresh effluent" from the Laguna WRP to meet irrigation demands. Much of this 5 MGD is taken by the flows to the

existing Rohnert Park Urban Reuse System. Any other flow must come from storage, which is located west of the Laguna WRP in the Meadowlane Ponds. An initial review of the effluent quality from the Meadowlane Ponds indicates that late irrigation season water quality is not adequate to supply urban users primarily because of algal growth that occurs in the stored water, which clogs irrigation systems. In addition, because the Laguna WRP uses ultraviolet light for disinfection, the recycled water does not have residual chlorine, which can prevent bacteriological re-growth in the distribution system. The Subregional System is currently installing a chlorination system for the Rohnert Park Urban Reuse System to reduce regrowth and improve water quality within the Rohnert Park Urban Reuse System.

Because of issues related to algae and bacteriological re-growth, the Subregional System has budgeted for polishing treatment for this source. For the purposes of developing costs, the conceptual polishing treatment system would include:

- A pipeline from the Meadowlane Ponds to the Laguna WRP;
- Installation of dissolved air floatation thickening (DAFT) to remove algae;
- Installation of polishing filters;
- Installation of a sodium hypochlorite disinfection system.

Depending on the actual water quality in the Meadowlane Ponds, it may be possible to eliminate the DAFT and to utilize existing wet-weather filter capacity in-lieu of new polishing filters.

Diurnal Storage

A diurnal storage tank would be utilized to store treated recycled water prior to delivery into the distribution system. For the purpose of developing costs, the storage tank was sized to be filled at the Peak Day flow rate and emptied at the Peak Hour flow rate. Diurnal storage is less costly than sizing transmission facilities to meet peak hour demand. Appendix 2 provides the sizing calculations. Diurnal storage was estimated at $1.00 per constructed gallon.

Transmission Pipeline

As described above under Capacity Analysis, a transmission pipeline that connects the low-pressure and high-pressure systems would be required. This pipeline has been sized as a 24-inch diameter pipeline to maximize the capacity available through the Rohnert Park Urban Reuse System.

Cost Summary

Table 6-1 shows the design quantities and costs necessary to upgrade the existing Subregional System facilities to serve new urban demands for high quality recycled water. The data was developed in the Feasibility Study for the Santa Rosa Urban Reuse Project. The City's maximum market demand of 52 MGY is quite small in comparison to Santa Rosa's demand of 1,000 MGY (52 MGY/1000 MGY = 5.2%). This incremental increase in demand can be accommodated within the engineering design tolerances of the various facilities. However, because the City would be using capacity, it would need to contribute to the cost of these facilities in proportion to the demand it placed upon them or as agreed upon between the entities.

Table 6-1: Summary Cost Estimate Subregional System Source Improvements[10]

Capital Costs Subregional System Improvement for 1000 MGY System					
Item No	**Item**	**Quantity**	**Unit**	**Unit Cost**	**Total Item Cost**
Polishing Treatment					
1	30 " Pipeline from Storage	1700	LF	$355	$603,500
2	Dissolved Air Flotation	1	LS	$2,873,281	$2,873,281
3	Conventional Filters	1	LS	$5,488,397	$5,488,397
4	Yard Piping	1	LS	$202,389	$202,389
5	Yard Electrical	1	LS	$796,806	$796,806
6	Sitework	1	LS	$468,044	$468,044
7	Diurnal Storage Tank	3.8	MG	$1,000,000	$3,800,000
8	Upgrades at Oakmont	0	LS	$2,710,000	$0
9	Satellite Treatment Facilities	0	LS	$9,386,000	$0
Transmission Pipeline					
11	24" Diameter	7700	LF	$245	$1,886,500
12	Poncia Pump Station Upgrade	1	LS	$800,000	$800,000
Subtotal Subregional System Improvements					**$40,650,000**

Seasonal Storage

The Subregional System uses seasonal storage to hold recycled water during the period of the year when supply exceeds demand for use when demand exceeds supply. The Subregional System currently has sufficient seasonal storage capacity to accommodate its existing recycled water users. However, additional seasonal storage may be required to accommodate new users. This analysis is based on the assumption that any new water recycling program would need to construct 0.625 gallons of storage for each new gallon of demand. The Subregional System has a high degree of hydraulic flexibility, which means that new seasonal storage facilities would not need to be constructed adjacent to new demands.

Because of this high degree of hydraulic flexibility, seasonal storage costs are a common cost to all recycled water networks developed to serve the urban reuse identified in the IRWP Master Plan and EIR.

The IRWP Master Plan presented a range of costs for storage depending on the location. This Study assumes a unit cost of $54,000 per MG which reflects the IRWP Master Plan unit cost of $52,000 per MG adjusted to 2006 dollars.

The Water Balance Model developed for the IRWP Master Plan revealed that, on the average, 5 gallons of seasonal storage would be required for each 8 gallons of new demand. This ratio was applied to all of the new demands for the urban system.

Distribution System Storage

This Study does not include a specific analysis of storage tanks within the recycled water distribution system.

[10] Santa Rosa Urban Reuse Project Feasibility Study, Appendix H, Alternative 1B with upsized transmission main.

Customer Connections

In order to deliver recycled water to new customers, the various customer sites must be retrofitted to comply with Title 22. Because all of the customers under consideration in this Study currently receive water through dedicated irrigation systems, it is unlikely that new onsite water systems will need to be constructed. However, the recycled water system operator will need to conduct a cross connection survey at each site (to assure that there are no connections between the potable water system and the irrigation system). It is likely that most sites will need some level of modifications to prevent overspray and runoff of recycled water and to assure compliance with Title 22 (e.g. picnic tables, barbeques, play equipment etc, may need to be relocated).

Site retrofit costs have been estimated at:

- $2,000 per AFY for sites using less than 3 AFY;
- $1,000 per AFY for sites using between 3 and 30 AFY;
- $500 per AFY for sites using over 30 AFY.

Chapter 7 provides additional information on the various entities that could ultimately operate the recycled water system and coordinate customer connections and service.

Operations and Maintenance Costs

In addition to capital costs, each alternative would have long term operational and maintenance costs. These would include the costs of treatment plant operations and maintenance, the cost of pipeline maintenance, pumping costs and program oversight costs.

The annual operations and maintenance cost for polishing treatment facilities at the Laguna WRP were estimated at 5 percent of the construction cost of the polishing treatment facilities.

Transmission pipeline operations and maintenance have been estimated at 1.5 percent of the construction cost. As indicated in Chapter 5, distribution system operations & maintenance costs have been estimated at 0.5 percent of the construction costs and pumping costs have been estimated based on horsepower used.

To estimate the level of staffing necessary to manage an urban recycled water program, several of the larger programs in northern California were contacted. In general, the program staffing requirements (over and above basic operational and maintenance requirements) were 0.5 FTEs for each 100 MGY delivered. Each FTE was estimated to have a cost of $100,000 annually.

6.3 Alternative Recycled Water Projects

The engineering criteria described in Chapter 5 were utilized to develop six alternative recycled water projects. Each project included the "common" source and seasonal storage improvements described above as well as in-city pipelines that would deliver recycled water to the users and retrofits necessary to allow users to accept recycled water.

These alternatives are described and illustrated below. Estimated costs are presented with each alternative. The convention established in Chapter 4, Market Assessment is followed here: C/I

users are illustrated with red dots; P/I users are illustrated with green dots; and residential users are illustrated with blue dots.

Alternative 1 Thomas Page School

This project alternative would deliver 4.1 MGY (12.55 AFY) to one customer, Thomas Page School, located near the western City limits. Recycled water would be delivered through a connection to the existing recycled main in Madrone Avenue that provides service to the Gallo Vineyard property. Recycled water in this main is pressurized at the Rohnert Park Pump Station and hence has adequate pressure to serve urban needs. The customer could be served by a relatively small pipeline, sized at 6-inches in diameter for estimating purposes. The cost of this project alternative is estimated to be approximately $485,000 and is detailed in Table 6-2. Figure 6-2 illustrates this alternative.

Table 6-2: Summary Cost Estimate Alternative 1 Thomas Page School

Alternative 1
Thomas Page School

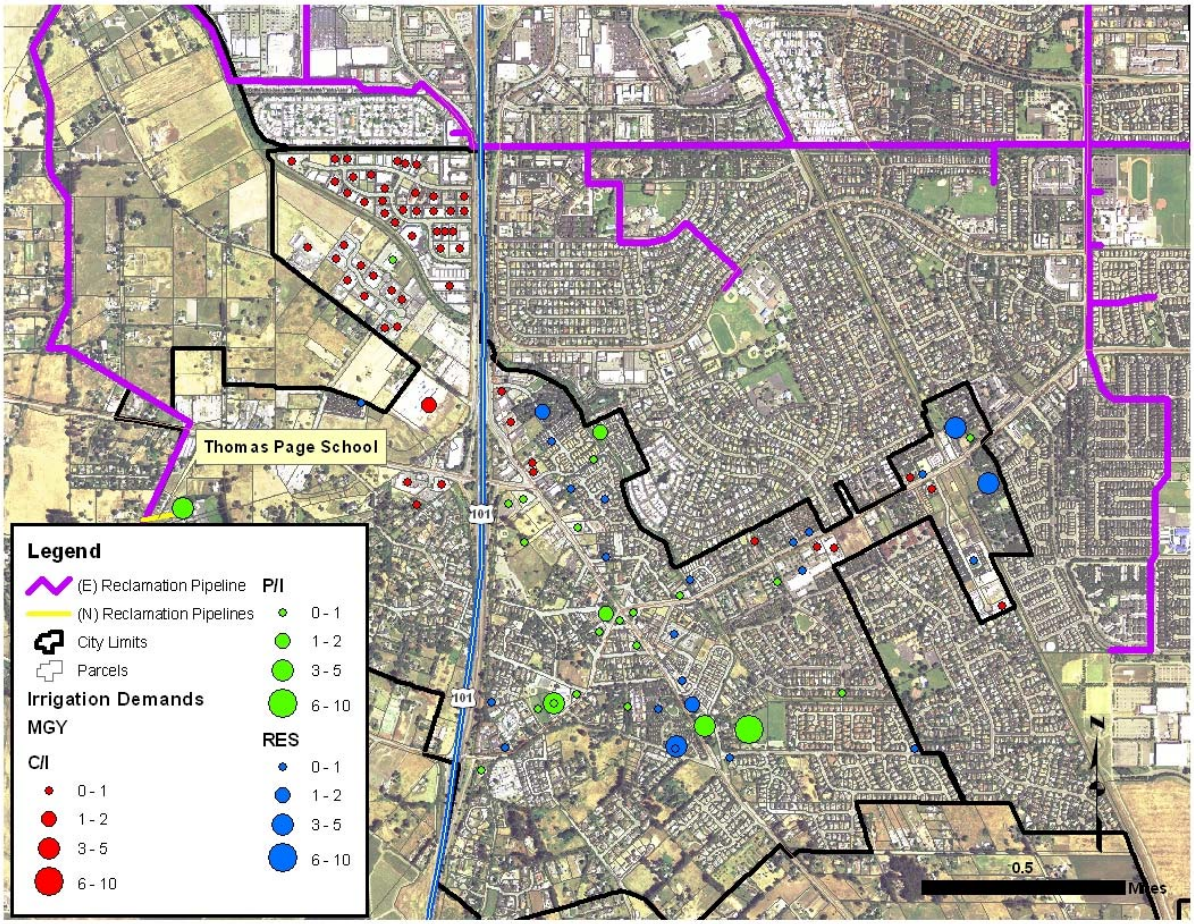
Demand in Million Gallons Per Year	4.1
Demand in Acre Feet Per Year	12.6
Peak Hour Demand (GPM)	80
Peak Day Demand (GPM)	20
% of Total Market Demand	7.82%
% of UWMP Target	41.96%

Item No	Item	Quantity	Unit	Unit Cost	Total Item Cost
Capital Costs Subregional System Improvement for 1000 MGY System					
Polishing Treatment					
1	30 " Pipeline from Storage	1700	LF	$355	$603,500
2	Dissolved Air Flotation	1	LS	$2,873,281	$2,873,281
3	Conventional Filters	1	LS	$5,488,397	$5,488,397
4	Yard Piping	1	LS	$202,389	$202,389
5	Yard Electrical	1	LS	$796,806	$796,806
6	Sitework	1	LS	$468,044	$468,044
7	Diurnal Storage Tank	3.8	MG	$1,000,000	$3,800,000
8	Upgrades at Oakmont	0	LS	$2,710,000	$0
9	Satellite Treatment Facilities	0	LS	$9,386,000	$0
Transmission Pipeline					
11	24" Diameter	7700	LF	$245	$1,886,500
12	Rohnert Park Pump Station Upgrade	1	LS	$800,000	$800,000
Subtotal Subregional System Improvements					**$40,650,000**
Cost Share of Subregion System Improvements*					**$166,665**
Capital Costs for in-City Improvements and Storage					
Distribution Pipelines					
13	6" Diameter	1000	LF	$75	$75,000
14	8" Diameter		LF	$80	$0
15	12" Diameter		LF	$110	$0
16	18" Diameter		LF	$190	$0
17	24" Diameter		LF	$245	$0
18	Land Use Corrections	1	LS	$0	$0
Subtotal					**$75,000**
Seasonal Storage					
19	Seasonal Storage Pond	2.56	MG	$54,100	$138,631
Subtotal					**$138,631**
User Site Retrofits**					
20	Volume delivered on sites using up to 3 AFY		AFY	$2,000	$0
21	Volume delivered on sites using between 3 and 30 AFY	12.6	AFY	$1,000	$12,587
22	Volume delivered on sites using over 30 AFY		AFY	$500	$0
Subtotal					**$12,587**
Budgetary Contingency		**23**	**%**		**$90,363**
Total Capital Costs					**$483,246**

Treatment O&M	$2,918
Transmission System O&M	$116
Distribution System O&M	$375
Pumping Costs	$287
Program Costs	$2,050
Total O&M Costs	**$5,746**
Total Annual Cost/MG (capital cost amortized for 30 years + O&M)	**$9,100**

* The City's Cost Share of the Subregional System Improvements is estimated by dividing the demand served by this alternative by the 1,000 MGY design capacity of the Santa Rosa Urban Reuse Project

Figure 6-2 Alternative 1 Thomas Page School



Alternative 2 Westside System

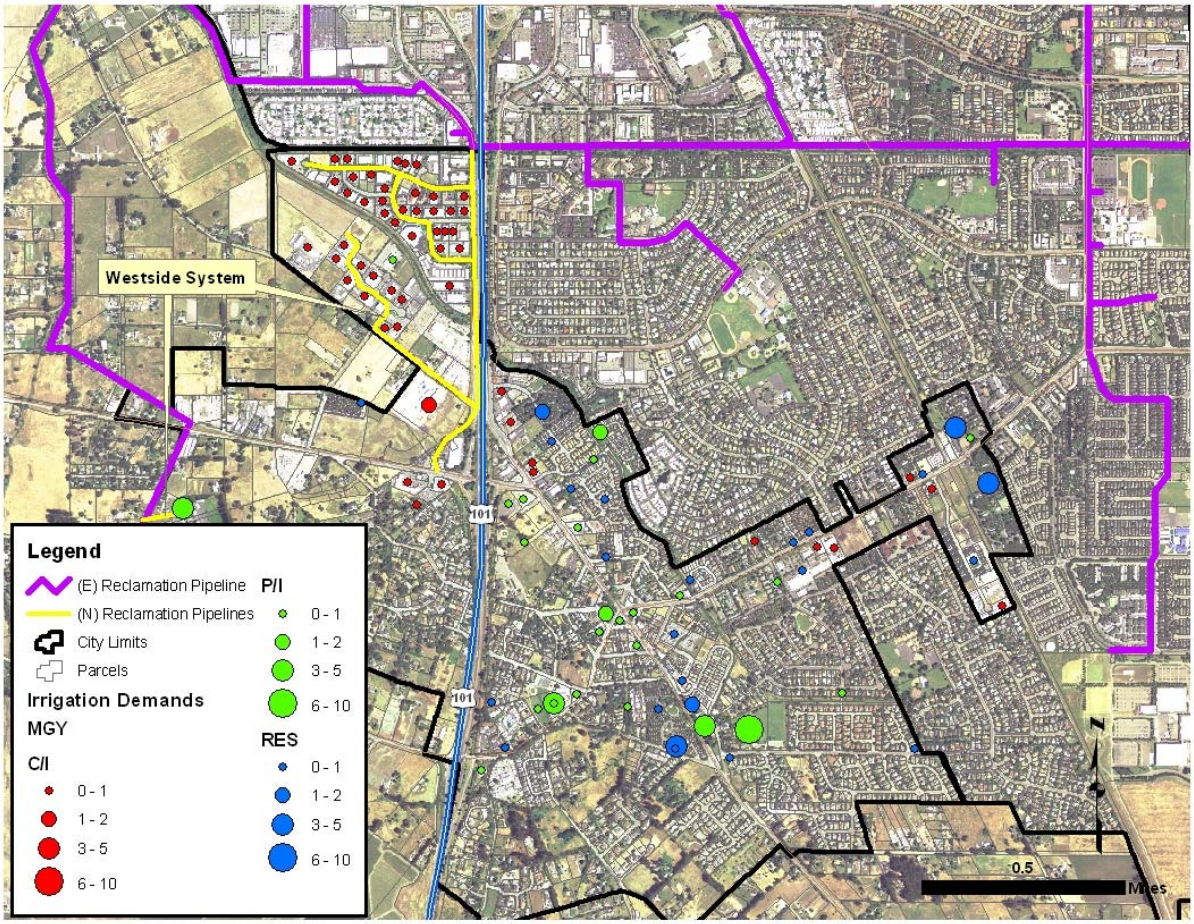
This project alternative would deliver 13.8 MGY (42.4 AFY) to approximately 46 customers, the majority of which are C/I irrigation accounts. The system includes delivery to Thomas Page School, as described above. In addition to the Madrone Avenue turnout, recycled water would be delivered into the northwest area of the City through a turn-out from 24-inch recycled water pipeline in the Copeland Creek right-of way, which it part of the Rohnert Park Urban Reuse System. A recycled water delivery pipeline (estimated at 8-inches in diameter) would be extended down Redwood Drive to State Highway 116. Recycled water distribution mains (estimated at 6-inches in diameter) would be extended up Portal Street, Aaron Street and Helman Lane to Blodget Street in order serve C/I irrigation demands. The cost of this project alternative is estimated to be approximately $2,846,000 and is detailed in Table 6-3. Figure 6-3 illustrates this alternative.

Table 6-3: Summary Cost Estimate Alternative 2 Westside System

Alternative 2 Westside System					
Demand in Million Gallons Per Year	13.8				
Demand in Acre Feet Per Year	42.4				
Peak Hour Demand (GPM)	269				
Peak Day Demand (GPM)	67				
% of Total Market Demand	26.34%				
% of UWMP Target	141.22%				
Capital Costs Subregional System Improvement for 1000 MGY System					
Item No	**Item**	**Quantity**	**Unit**	**Unit Cost**	**Total Item Cost**
Polishing Treatment					
1	30 " Pipeline from Storage	1700	LF	$355	$603,500
2	Dissolved Air Flotation	1	LS	$2,873,281	$2,873,281
3	Conventional Filters	1	LS	$5,488,397	$5,488,397
4	Yard Piping	1	LS	$202,389	$202,389
5	Yard Electrical	1	LS	$796,806	$796,806
6	Sitework	1	LS	$468,044	$468,044
7	Diurnal Storage Tank	3.8	MG	$1,000,000	$3,800,000
8	Upgrades at Oakmont	0	LS	$2,710,000	$0
9	Satellite Treatment Facilities	0	LS	$9,386,000	$0
Transmission Pipeline					
11	24" Diameter	7700	LF	$245	$1,886,500
12	Rohnert Park Pump Station Upgrade	1	LS	$800,000	$800,000
Cost Share of Subregion System Improvements*					**$40,650,000**
					$560,970
Capital Costs for in-City Improvements and Storage					
Distribution Pipelines					
13	6" Diameter	6,000	LF	$75	$450,000
14	8" Diameter	8,000	LF	$80	$640,000
15	12" Diameter		LF	$110	$0
16	18" Diameter		LF	$190	$0
17	24" Diameter		LF	$245	$0
18	Land Use Corrections	1	LS	$128,000	$128,000
Subtotal					**$1,218,000**
Seasonal Storage					
19	Seasonal Storage Pond	8.63	MG	$54,100	$466,613
Subtotal					**$466,613**
User Site Retrofits**					
20	Volume delivered on sites using up to 3 AFY	26.2	AFY	$2,000	$52,312
21	Volume delivered on sites using between 3 and 30 AFY	16.21	AFY	$1,000	$16,210
22	Volume delivered on sites using over 30 AFY		AFY	$500	$0
Subtotal					**$68,522**
Budgetary Contingency		**23**	**%**		**$532,244**
Total Capital Costs					**$2,846,349**
Treatment O&M					$9,820
Transmission System O&M					$391
Distribution System O&M					$6,090
Pumping Costs					$966
Program Costs					$6,900
Total O&M Costs					**$24,167**
Total Annual Cost/MG (capital cost amortized for 30 years + O&M)					**$15,200**

* The City's Cost Share of the Subregional System Improvements is estimated by dividing the demand served by this alternative by the 1,000 MGY design capacity of the Santa Rosa Urban Reuse Project

Figure 6-3: Alternative 2 Westside System



Alternative 3 Eastside Gateway System

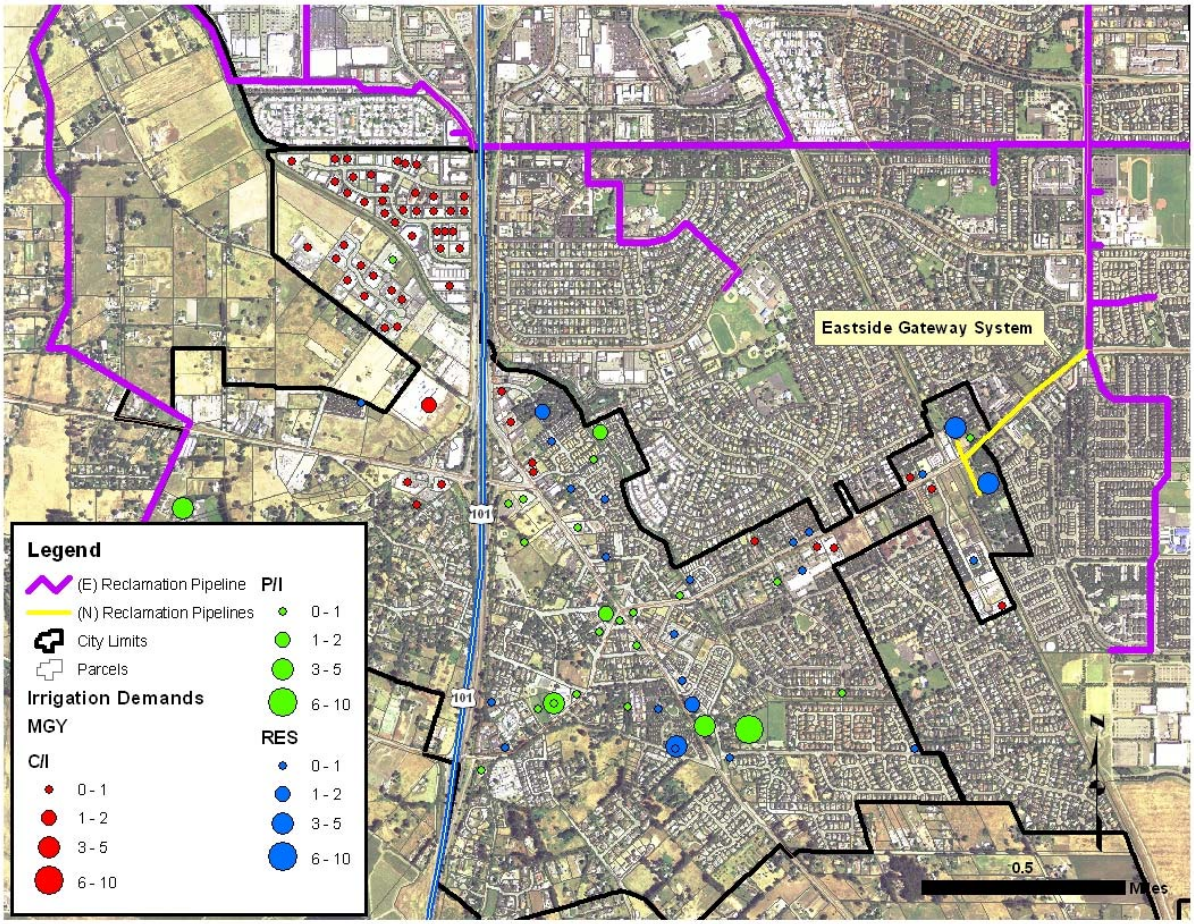
Similar to Alternative 1, this project alternative would capitalize on the proximity of several large irrigation users to existing recycled water pipelines. This alternative would deliver 6.16 MGY (19.0 AFY) to three irrigation customers near the eastern City limits. Recycled water would be delivered from a turn-out on the existing recycled water main in Snyder Lane. An 8-inch recycled water line would be extended along East Cotati Avenue to the Sunflower Drive/Windmill Farms area. The cost of this project alternative is estimated to be approximately $942,000 and is detailed in Table 6-4. Figure 6-4 illustrates this alternative.

Table 6-4: Summary Cost Estimate Alternative 3 Eastside Gateway System

Alternative 3 Eastside Gateway System					
Demand in Million Gallons Per Year	6.16				
Demand in Acre Feet Per Year	18.9				
Peak Hour Demand (GPM)	120				
Peak Day Demand (GPM)	30				
% of Total Market Demand	11.76%				
% of UWMP Target	63.04%				
Capital Costs Subregional System Improvement for 1000 MGY System					
Item No	**Item**	**Quantity**	**Unit**	**Unit Cost**	**Total Item Cost**
Polishing Treatment					
1	30 " Pipeline from Storage	1700	LF	$355	$603,500
2	Dissolved Air Flotation	1	LS	$2,873,281	$2,873,281
3	Conventional Filters	1	LS	$5,488,397	$5,488,397
4	Yard Piping	1	LS	$202,389	$202,389
5	Yard Electrical	1	LS	$796,806	$796,806
6	Sitework	1	LS	$468,044	$468,044
7	Diurnal Storage Tank	3.8	MG	$1,000,000	$3,800,000
8	Upgrades at Oakmont	0	LS	$2,710,000	$0
9	Satellite Treatment Facilities	0	LS	$9,386,000	$0
Transmission Pipeline					
11	24" Diameter	7700	LF	$245	$1,886,500
12	Rohnert Park Pump Station Upgrade	1	LS	$800,000	$800,000
Subtotal Subregional System Improvements					**$40,650,000**
Cost Share of Subregion System Improvements*					**$250,404**
Capital Costs for in-City Improvements and Storage					
Distribution Pipelines					
13	6" Diameter		LF	$75	$0
14	8" Diameter	3,000	LF	$80	$240,000
15	12" Diameter		LF	$110	$0
16	18" Diameter		LF	$190	$0
17	24" Diameter		LF	$245	$0
18	Land Use Corrections (assumes 3,000 LF with 1.2 factor)	1	LS	$48,000	$48,000
Subtotal					**$288,000**
Seasonal Storage					
19	Seasonal Storage Pond	3.85	MG	$54,100	$208,285
Subtotal					**$208,285**
User Site Retrofits**					
20	Volume delivered on sites using up to 3 AFY		AFY	$2,000	$0
21	Volume delivered on sites using between 3 and 30 AFY	18.9	AFY	$1,000	$18,900
22	Volume delivered on sites using over 30 AFY		AFY	$500	$0
Subtotal					**$18,900**
Budgetary Contingency		**23**	**%**		**$176,085**
Total Capital Costs					**$941,674**
Treatment O&M					$4,384
Transmission System O&M					$174
Distribution System O&M					$1,440
Pumping Costs					$431
Program Costs					$3,080
Total O&M Costs					**$9,509**
Total Annual Cost/MG (capital cost amortized for 30 years + O&M)					**$11,500**

* The City's Cost Share of the Subregional System Improvements is estimated by dividing the demand served by this alternative by the 1,000 MGY design capacity of the Santa Rosa Urban Reuse Project

Figure 6-4: Alternative 3 Eastside Gateway System



Alternative 4 Eastside System

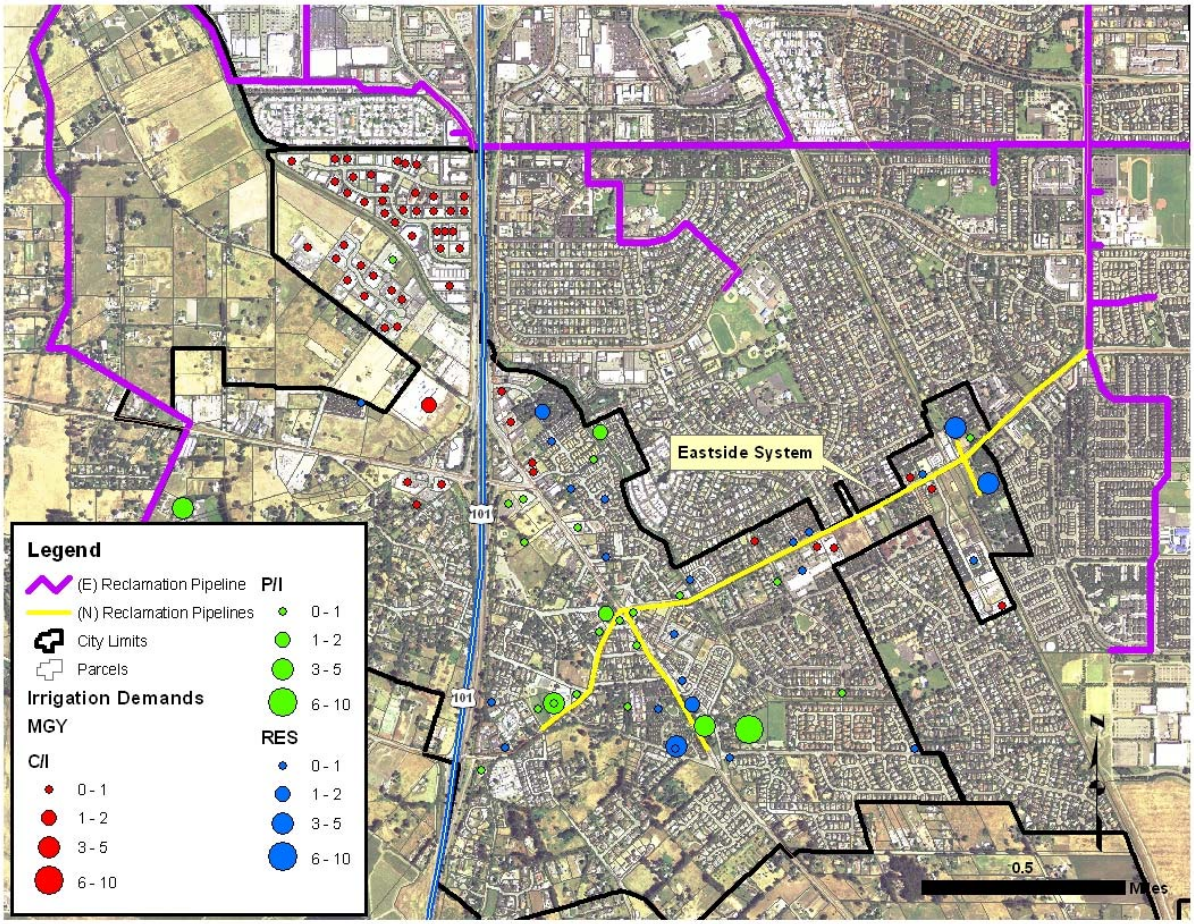
This project alternative would extend recycled water service along East Cotati Avenue to The Hub and then south along Old Redwood Highway to Helen Putnam Park and southwest along West Sierra Avenue to serve the Civic Center area. This alternative would deliver 27.5 MGY (85 AFY) to approximately 32 customers. The cost of this project alternative is estimated to be approximately $4,060,000 and is detailed in Table 6-5. Figure 6-5 illustrates this alternative.

Table 6-5: Summary Cost Alternative 4 Eastside System

Alternative 4 Eastside System					
Demand in Million Gallons Per Year				27.5	
Demand in Acre Feet Per Year				84.43	
Peak Hour Demand (GPM)				536	
Peak Day Demand (GPM)				134	
% of Total Market Demand				52.48%	
% of UWMP Target				281.42%	
Capital Costs Subregional System Improvement for 1000 MGY System					
Item No	**Item**	**Quantity**	**Unit**	**Unit Cost**	**Total Item Cost**
Polishing Treatment					
1	30 " Pipeline from Storage	1700	LF	$355	$603,500
2	Dissolved Air Flotation	1	LS	$2,873,281	$2,873,281
3	Conventional Filters	1	LS	$5,488,397	$5,488,397
4	Yard Piping	1	LS	$202,389	$202,389
5	Yard Electrical	1	LS	$796,806	$796,806
6	Sitework	1	LS	$468,044	$468,044
7	Diurnal Storage Tank	3.8	MG	$1,000,000	$3,800,000
8	Upgrades at Oakmont	0	LS	$2,710,000	$0
9	Satellite Treatment Facilities	0	LS	$9,386,000	$0
Transmission Pipeline					
11	24" Diameter	7700	LF	$245	$1,886,500
12	Rohnert Park Pump Station Upgrade	1	LS	$800,000	$800,000
Subtotal Subregional System Improvements					**$40,650,000**
Cost Share of Subregion System Improvements*					**$1,117,875**
Capital Costs for in-City Improvements and Storage					
Distribution Pipelines					
13	6" Diameter		LF	$75	$0
14	8" Diameter	12,000	LF	$80	$960,000
15	12" Diameter		LF	$110	$0
16	18" Diameter		LF	$190	$0
17	24" Diameter		LF	$245	$0
18	Land Use Corrections (assumes 12,000 LF with 1.2 factor)	1	LS	$192,000	$192,000
Subtotal					**$1,152,000**
Seasonal Storage					
19	Seasonal Storage Pond	17.19	MG	$54,100	$929,844
Subtotal					**$929,844**
User Site Retrofits**					
20	Volume delivered on sites using up to 3 AFY	16.54	AFY	$2,000	$33,070
21	Volume delivered on sites using between 3 and 30 AFY	67.89	AFY	$1,000	$67,890
22	Volume delivered on sites using over 30 AFY		AFY	$500	$0
Subtotal					**$100,960**
Budgetary Contingency		**23**	**%**		**$759,156**
Total Capital Costs					**$4,059,835**
Treatment O&M					$19,570
Transmission System O&M					$778
Distribution System O&M					$5,760
Pumping Costs					$1,925
Program Costs					$13,750
Total O&M Costs					**$41,783**
Total Annual Cost/MG (capital cost amortized for 30 years + O&M)					**$11,100**

* The City's Cost Share of the Subregional System Improvements is estimated by dividing the demand served by this alternative by the 1,000 MGY design capacity of the Santa Rosa Urban Reuse Project

Figure 6-5: Alternative 4 Eastside System



Alternative 5 Westside Extension

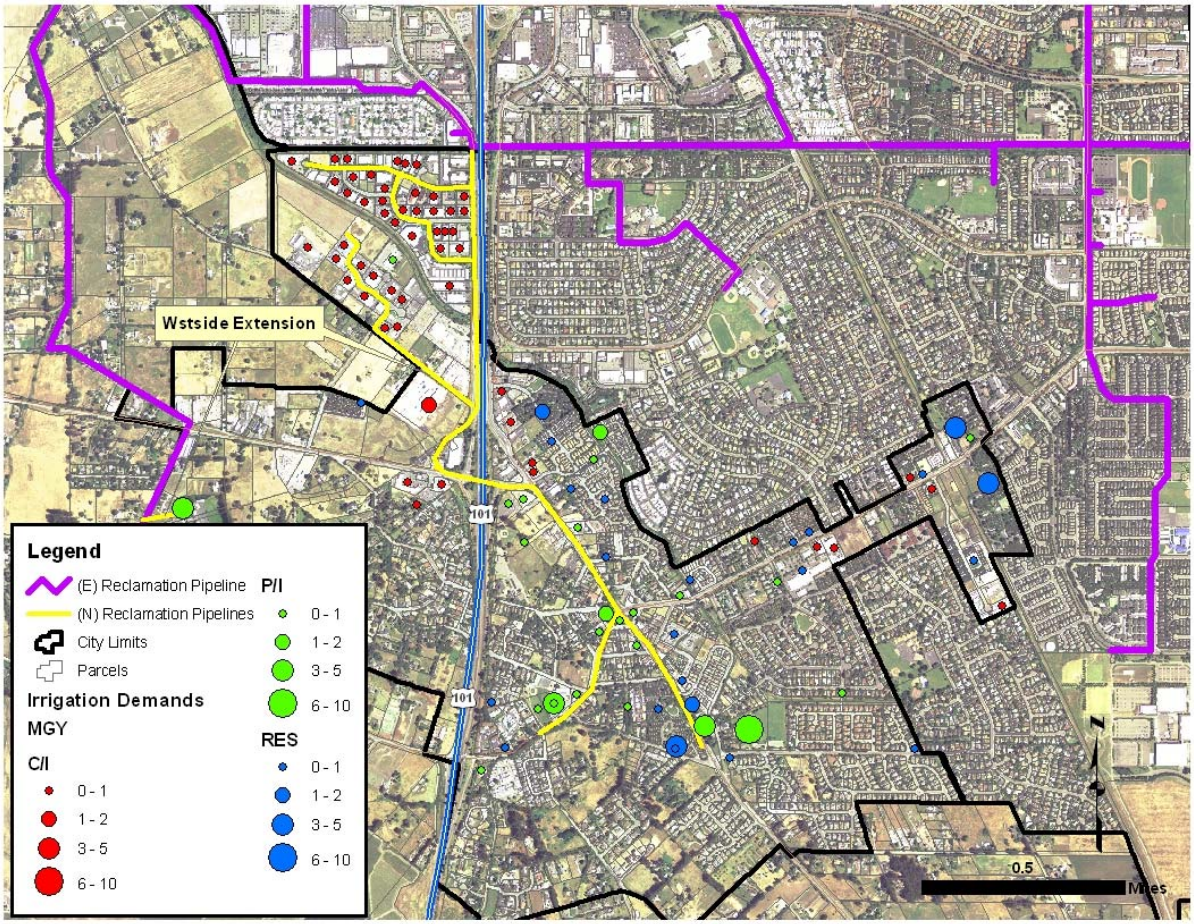
This project alternative was developed in order to analyze the potential of serving the recycled water demand in the south central portion of the system from a connection to the west side system, rather than through a pipeline extension along East Cotati Avenue. This project alternative would extend recycled water service from the intersection of Redwood Drive and Highway 116, along Highway 116 to Old Redwood Highway and then south along Old Redwood Highway to Helen Putnam Park and southwest along West Sierra Avenue to serve the Civic Center area. This alternative would deliver 33 MGY (100 AFY). The cost of this project alternative is estimated to be approximately $5,535,000 and is detailed in Table 6-6. Figure 6-6 illustrates this alternative.

Table 6-6: Summary Cost Estimate Alternative 5 Westside Extension

Alternative 5 Westside Extension					
Demand in Million Gallons Per Year				33.22	
Demand in Acre Feet Per Year				101.99	
Peak Hour Demand (GPM)				648	
Peak Day Demand (GPM)				162	
% of Total Market Demand				63.40%	
% of UWMP Target				339.95%	
Capital Costs Subregional System Improvement for 1000 MGY System					
Item No	**Item**	**Quantity**	**Unit**	**Unit Cost**	**Total Item Cost**
Polishing Treatment					
1	30 " Pipeline from Storage	1700	LF	$355	$603,500
2	Dissolved Air Flotation	1	LS	$2,873,281	$2,873,281
3	Conventional Filters	1	LS	$5,488,397	$5,488,397
4	Yard Piping	1	LS	$202,389	$202,389
5	Yard Electrical	1	LS	$796,806	$796,806
6	Sitework	1	LS	$468,044	$468,044
7	Diurnal Storage Tank	3.8	MG	$1,000,000	$3,800,000
8	Upgrades at Oakmont	0	LS	$2,710,000	$0
9	Satellite Treatment Facilities	0	LS	$9,386,000	$0
Transmission Pipeline					
11	24" Diameter	7700	LF	$245	$1,886,500
12	Rohnert Park Pump Station Upgrade	1	LS	$800,000	$800,000
Subtotal Subregional System Improvements					**$40,650,000**
Cost Share of Subregion System Improvements*					**$1,350,393**
Capital Costs for in-City Improvements and Storage					
Distribution Pipelines					
13	6" Diameter	13,000	LF	$75	$975,000
14	8" Diameter	9,500	LF	$80	$760,000
15	12" Diameter		LF	$110	$0
16	18" Diameter		LF	$190	$0
17	24" Diameter		LF	$245	$0
18	Land Use Corrections (assumes 9,500 LF with 1.2 factor)	1	LS	$152,000	$152,000
Subtotal					**$1,887,000**
Seasonal Storage					
19	Seasonal Storage Pond	20.76	MG	$54,100	$1,123,251
Subtotal					**$1,123,251**
User Site Retrofits**					
20	Volume delivered on sites using up to 3 AFY	37.33	AFY	$2,000	$74,651
21	Volume delivered on sites using between 3 and 30 AFY	64.66	AFY	$1,000	$64,660
22	Volume delivered on sites using over 30 AFY		AFY	$500	$0
Subtotal					**$139,311**
Budgetary Contingency		**23**	**%**		**$1,034,990**
Total Capital Costs					**$5,534,945**
Treatment O&M					$23,640
Transmission System O&M					$940
Distribution System O&M					$9,435
Pumping Costs					$2,325
Program Costs					$16,610
Total O&M Costs					**$52,950**
Total Annual Cost/MG (capital cost amortized for 30 years + O&M)					**$12,400**

* The City's Cost Share of the Subregional System Improvements is estimated by dividing the demand served by this alternative by the 1,000 MGY design capacity of the Santa Rosa Urban Reuse Project

Figure 6-6: Alternative 5 Westside Extension



Alternative 6 Citywide Looped Distribution System

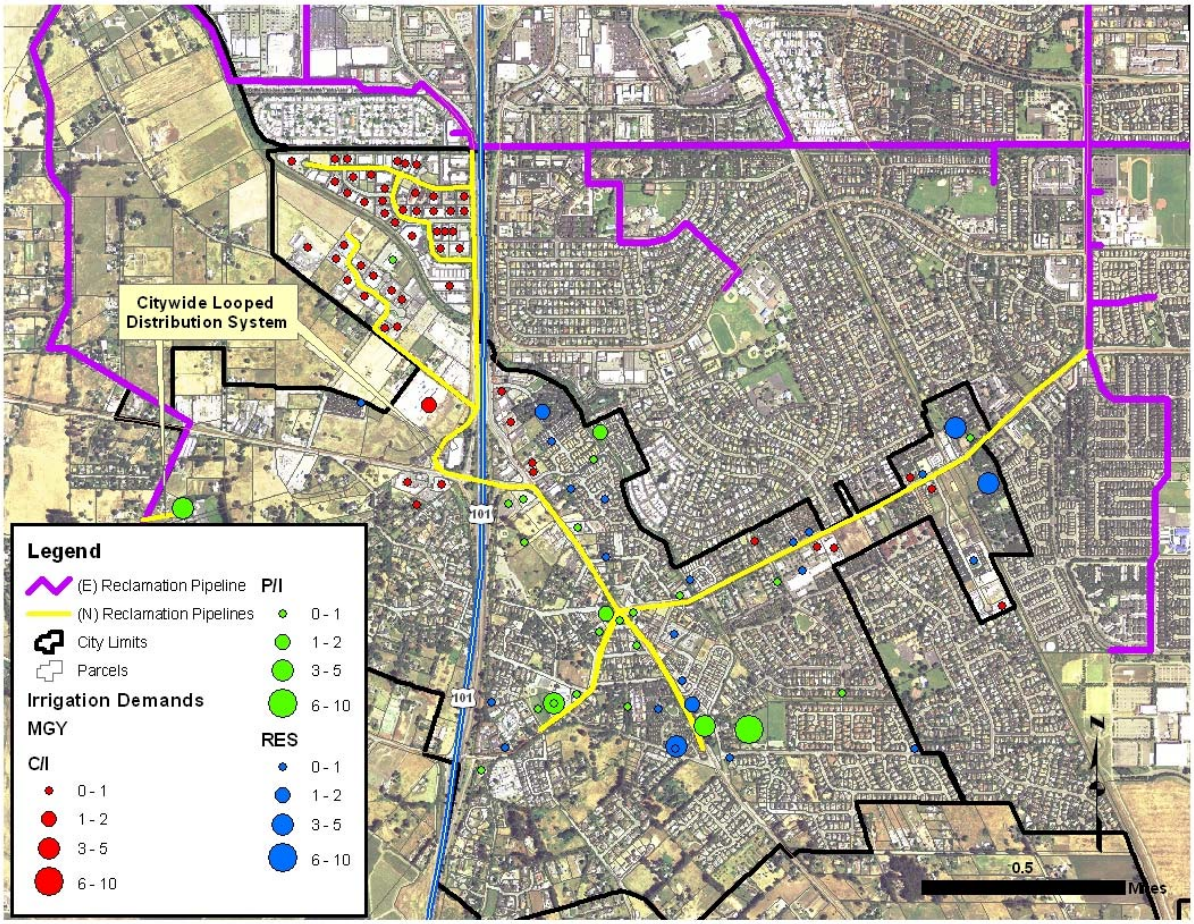
This project alternative provides for a looped distribution system. The looped system could be developed in phases that build upon an initial Westside or Eastside Gateway System. The interconnection would enhance the overall system reliability and would allow the City to ultimately deliver 43 MGY (132 AFY) or approximately 82% of its total market. The cost of this project alternative is estimated to be approximately $7,310,000 and is detailed in Table 6-7. Figure 6-7 illustrates this alternative.

Table 6-7: Summary Cost Estimate Alternative 6 Citywide Looped Distribution System

Alternative 6 Citywide Looped system					
Demand in Million Gallons Per Year	43				
Demand in Acre Feet Per Year	132.01				
Peak Hour Demand (GPM)	839				
Peak Day Demand (GPM)	210				
% of Total Market Demand	82.06%				
% of UWMP Target	440.03%				
Capital Costs Subregional System Improvement for 1000 MGY System					
Item No	**Item**	**Quantity**	**Unit**	**Unit Cost**	**Total Item Cost**
Polishing Treatment					
1	30 " Pipeline from Storage	1700	LF	$355	$603,500
2	Dissolved Air Flotation	1	LS	$2,873,281	$2,873,281
3	Conventional Filters	1	LS	$5,488,397	$5,488,397
4	Yard Piping	1	LS	$202,389	$202,389
5	Yard Electrical	1	LS	$796,806	$796,806
6	Sitework	1	LS	$468,044	$468,044
7	Diurnal Storage Tank	3.8	MG	$1,000,000	$3,800,000
8	Upgrades at Oakmont	0	LS	$2,710,000	$0
9	Satellite Treatment Facilities	0	LS	$9,386,000	$0
Transmission Pipeline					
11	24" Diameter	7700	LF	$245	$1,886,500
12	Rohnert Park Pump Station Upgrade	1	LS	$800,000	$800,000
Subtotal Subregional System Improvements					**$40,650,000**
Cost Share of Subregion System Improvements*					**$1,747,950**
Capital Costs for in-City Improvements and Storage					
Distribution Pipelines					
13	6" Diameter	13,000	LF	$75	$975,000
14	8" Diameter	16,500	LF	$80	$1,320,000
15	12" Diameter		LF	$110	$0
16	18" Diameter		LF	$190	$0
17	24" Diameter		LF	$245	$0
18	Land Use Corrections (assumes 16,500 LF with 1.2 factor)	1	LS	$264,000	$264,000
Subtotal					**$2,559,000**
Seasonal Storage					
19	Seasonal Storage Pond	26.88	MG	$54,100	$1,453,938
Subtotal					**$1,453,938**
User Site Retrofits**					
20	Volume delivered on sites using up to 3 AFY	48.11	AFY	$2,000	$96,220
21	Volume delivered on sites using between 3 and 30 AFY	83.9	AFY	$1,000	$83,900
22	Volume delivered on sites using over 30 AFY		AFY	$500	$0
Subtotal					**$180,120**
Budgetary Contingency		**23**	**%**		**$1,366,432**
Total Capital Costs					**$7,307,439**
Treatment O&M					$30,600
Transmission System O&M					$1,217
Distribution System O&M					$12,795
Pumping Costs					$3,010
Program Costs					$21,500
Total O&M Costs					**$69,121**
Total Annual Cost/MG (capital cost amortized for 30 years + O&M)					**$12,700**

* The City's Cost Share of the Subregional System Improvements is estimated by dividing the demand served by this alternative by the 1,000 MGY design capacity of the Santa Rosa Urban Reuse Project

Figure 6-7: Alternative 6 Citywide Looped Distribution System



6.4 Alternative Analysis and Recommendations

Alternatives 1 and 3 are the most cost-effective options for the City. Both alternatives capitalize on the City's proximity to existing recycled water pipelines and both alternatives capture several large users, which increases the efficiency of the projects, reduces onsite retrofit costs and minimizes program management efforts because there are relatively few customers. Together these two alternatives deliver just over 30 AFY, allowing the City to utilize the recycled water supply in a manner that is consistent with its UWMP.

All alternatives carry a significant cost component related to improvements of the Subregional System infrastructure. The Subregional System is currently engaged in predesign work related to expanded urban reuse and these costs may be refined over time. The City should actively track this process and review the alternative evaluation as more refined design concepts and costs are developed. Should costs related to the Subregional System be reduced, the City could consider extending additional pipelines and capturing more of its recycled water market.

Chapter 7 Project Economics and Implementation

7.1 Introduction

This chapter includes the preliminary economic review of a Cotati Urban Reuse Project. Because the Project could create both water supply and wastewater disposal supply benefits, costs could be reasonably allocated to both the City's water utility and the Subregional System. This chapter provides an overview of the economics related to recycled water within the Subregional System's service area; describes potential outside funding sources that could fund some portion of project construction; outlines utility policy issues that the City will need to address; and discusses implementation issues.

7.2 Project Economics

As described in Chapter 3, the City's UWMP projects that recycled water could become a portion of the City's water supply portfolio, in order to both enhance reliability and meet future demand. As indicated in Chapter 2, the Subregional System has analyzed urban water recycling as one of a host of alternatives to meet future wastewater disposal needs. A successful urban recycled water project will meet both water supply and wastewater disposal needs cost effectively. This section briefly recaps the cost of various alternative water supply and wastewater disposal alternatives and analyzes the cost-sharing potential between utilities.

Alternative Water Supply Options

The City's UWMP identifies the following future water supply options, in addition to recycled water:

- The Agency's Water Project. The Water Project involves increasing the Agency's diversion rights and expanding its transmission system capacity. In order to expand its diversion rights, the Agency is considering three distinct diversion alternatives, Aquifer Diversion and two variations on a Surface Water Treatment (SWT). Each of these alternatives will allow the Agency to expand its water rights by 26,000 AFY to 101,000 AFY (8,470 MGY)[11]
- Water Conservation. The City's ongoing water conservation program is expected to yield 43 MGY in water savings.

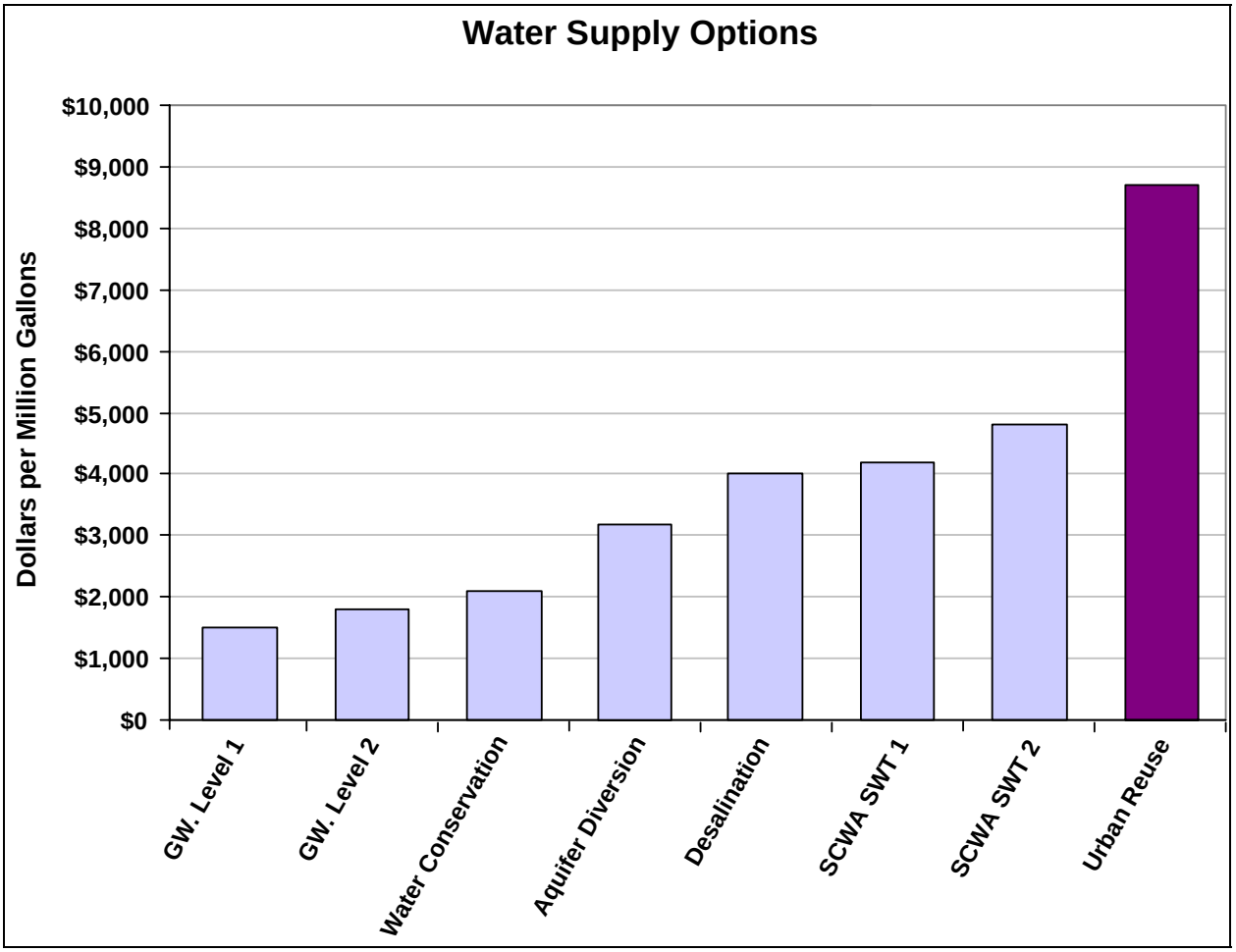
For the purposes of providing a comprehensive economic analysis, this study also includes review of cost and economic data for groundwater development and desalination. While these supplies are not currently under consideration by the City, other Water Contractors and Customers have developed data that can be used to expand the economic comparison.

[11] Based upon the Agency's EIR for its WSTSP. These alternatives may be revised during the EIR process for the water project. The economic analysis should be updated based upon revisions in the Agency's alternatives or costs.

- Groundwater. For the purposes of economic comparison, this Study evaluates the option of developing additional groundwater supplies. The costs and yields developed by the City of Santa Rosa have been used in the economic analysis.
- Desalination. For the purposes of economic comparison, this Study evaluates the option of participating in a desalination project similar to that proposed by Marin Municipal Water District. The costs and yield for Marin Municipal Water District's project as outlined in its Proposition 50 funding application have been used in the economic analysis.

Figure 7-1, below, illustrates the normalized costs (in dollars per MG) for the various water supply options, including urban reuse.

Figure 7-1: Water Supply Options and Unit Costs



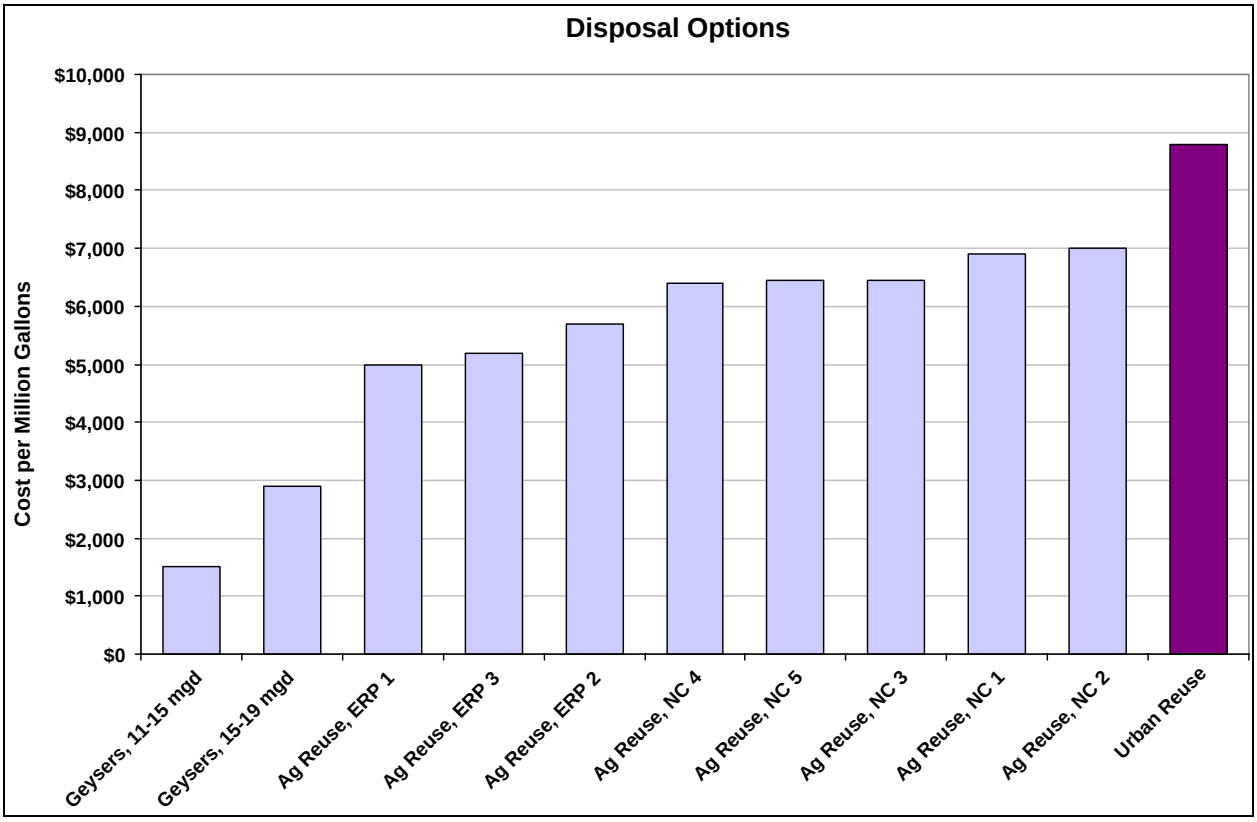
Alternative Disposal Options

While the City has not requested additional wastewater disposal capacity beyond its current allocation, the Subregional System is pursuing the IRWP to meet the needs of two member agencies, the cities of Santa Rosa and Rohnert Park. In addition to the urban reuse, the IRWP identified that additional wastewater disposal capacity could be secured by:

- Developing new agricultural reuse in north Sonoma County (Ag Reuse NC) or East of the City of Rohnert Park (Ag Reuse ERP). According to the IRWP Master Plan Ag Reuse NC could be developed in up to 5 increments and provide up to 2,200 MG of capacity. Ag Reuse ERP could be developed in three increments and is limited to 783 MG.
- Expanding the Geysers Recharge Project. According to the IRWP Master Plan, the Geysers Expansion could be accomplished in 2 increments and provide up to 2,200 MG of capacity.

Figure 7-2, below, illustrates the normalized costs (in dollars per MG) for the various wastewater disposal options, including the recommended Project (Alternative 2a – 1000 MGY West-South).

Figure 7-2: Wastewater Disposal Options and Unit Costs



Utility Cost Allocation

Urban reuse is not a cost-effective alternative when viewed as solely a water supply or wastewater disposal alternative. However, if costs were shared between the two utilities, the urban reuse becomes much more competitive. If the City were to fund 40 percent of an urban reuse project through its water utility as a potable water offset, the remaining projects costs would be allocated as a disposal cost and this portion might be supported by the Subregional System as a relatively cost-effective disposal option. This partnership could also be attractive to the Subregional System because the City would be a willing recycled water customer. Figures 7-3a and 7-3b, below illustrate this cost allocation approach.

The ultimate cost sharing arrangement between the City and the Subregional System will depend on the timing of the project. The Subregional System's strategy for pursuing IRWP

projects is to pursue the least cost alternatives first and the more expensive alternatives later during implementation. Because the Geysers Expansion increments are the least expensive disposal alternatives, the City may need to contribute more towards the cost of its urban reuse project if it wished to pursue the project during the time when the Subregional System still had these lower cost disposal alternatives available. The ultimate cost-sharing arrangement between the City and the Subregional System will need to be negotiated within the framework of the Subregional System Agreement.

Figure 7-3a: Water Supply Options

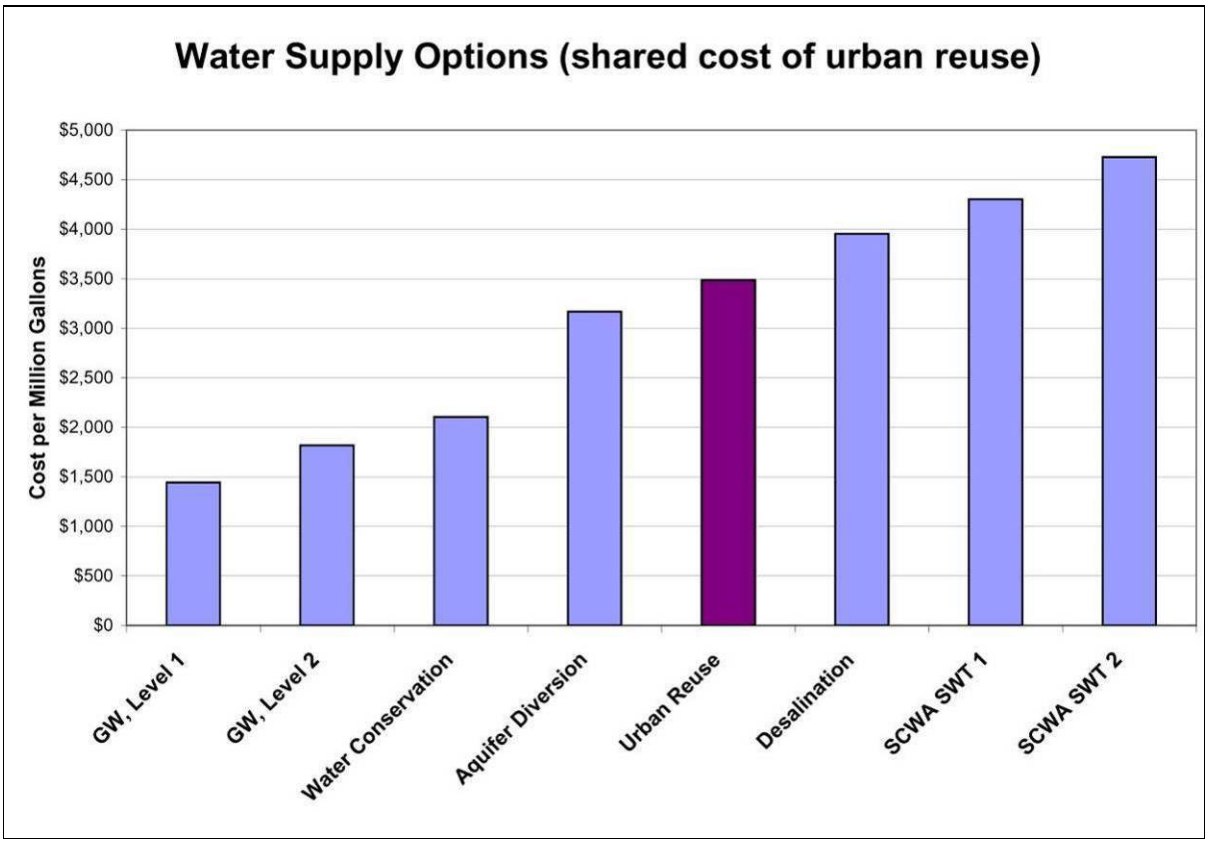
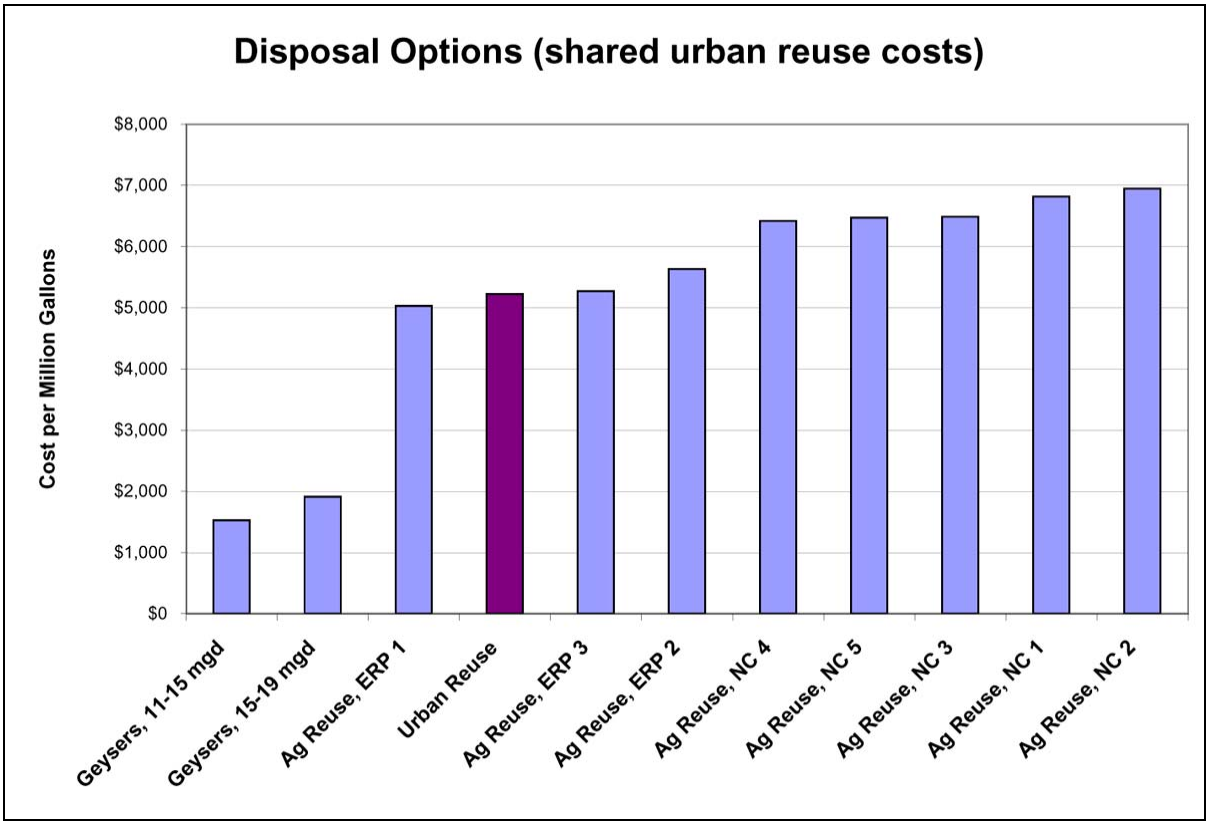


Figure 7-3b: Disposal Options



7.3 Funding Sources

Any urban reuse will require funding sources for both capital construction costs and long-term operations and maintenance costs. The economic analysis illustrated that these costs can be equitably split between the City's water utility and the Subregional System. This section provides a brief overview of the funding sources that could be utilized.

Local Funding Sources

Certificates of Participation: Certificates of Participation (COPs) are a long-term financing mechanism, typically secured by the revenues (rates) of water and sewer utilities. COPs are the most common funding mechanism used in California for financing larger, local utility infrastructure projects. COPs can be used in combination with State loans and outside grants.

Demand (Connection) Fees: Demand fees are expenditures that developers are required to make as a precondition to approval of their project. These fees, typically established under the Authority of Government Code Section 66000, are calculated to provide the funding necessary to construct new capacity for new development. The City currently collects demand fees for both its water and wastewater utilities and could collect a Recycled Water Demand Fee. The City may establish or updated its demand fees based on the current planning level cost estimates for urban reuse and can begin to collect the funds after holding a noticed public hearing. Demand fee revenue can be used to fund project construction directly (which is known as a Pay-as-you-go Program) or it can be used to make debt service payments. Demand fee revenue can be volatile, because it is tied to development applications, over which the City has

no control. Because of this volatility, demand fee revenue typically cannot be used as the only security for debt, although it can be part of an overall program that balances utility rates with funding from new development.

Because the test for establishing or updating demand fees is "reasonableness", agencies have the ability to craft these fees to address local issues and concerns. The Cities of Santa Rosa and American Canyon, carry a recycled water component in their Sewer Impact Fees. The Dublin San Ramon/East Bay MUD Recycled Water Authority (DERWA) has a separate Recycled Water Impact Fee that it charges to new development.

Regional Funding Sources

Local Supply Recycled Water and Tier II Water Conservation Funding: The Agency provides funds to Water Contractors for the development of local supplies, recycled water and conservation programs. The Agency prioritizes these funds for construction efforts rather than planning or environmental review.

State Funding Sources

The funding sources could be pursued by the City, but the City's activities may be more effective if they are undertaken in partnership with the Subregional System.

State Water Resources Control Board Planning Grants: The State Water Resources Control Board (SWRCB) provides planning grants up to $75,000 to fund master planning and CEQA documentation for recycled water projects. The planning grant program, unlike the Recycled Water Construction Grant Program, it does not rely on new bond sales. Also, unlike the Construction Grant Program, the planning grant program does not require that funded projects be located in the CalFed Solution Area (which the City is not). Application to this program requires completion of a one-page standard form and detailed work plan. Applications are processed and approved at a staff level, which typically takes 3 to 5 months.

Integrated Regional Water Management Plan Grants (IRWMP Grants provided by Propositions 50 and 84): The Subregional System is currently working with the North Coast Integrated Regional Water Management Program (NCIRWMP) and has included Urban Reuse in its Sonoma County Water Recycling and Habitat Conservation Program (SCWRHCP) which is part of the Regional Plan. Phase 1 of SCWRHCP has been included in the North Coast's Phase 1 IRWMP Grant application, which has been awarded $25 million in grant funding by the Department of Water Resources and the State Water Resources Control Board. The recently approved Proposition 84 includes funding earmarks for specific regions that have been developing plans under the IRWP Program. The North Coast Region has an earmark of $37,000,000, which would provide additional funding for NCIRWMP implementation, including urban reuse projects.

Federal Funding Sources

This funding source could be pursued by the City, but the City's activities may be more effective if they are undertaken in partnership with the Subregional System.

United States Bureau of Reclamation Title XVI Funding: Title XVI is a program that can provide up to 25 percent matching grants for qualifying water recycling projects. The program requires the preparation of a Feasibility Study and environmental documentation under both

CEQA and National Environmental Policy Act (NEPA). Planning documentation is reviewed by Bureau staff and if approved, project applicants begin a two-step legislative process where the project is first approved by Congress and then funded through an appropriations bill. The Title XVI program has been notoriously difficult to access, however current Federal Legislation, the "Reclaiming the Nations Water Act" (Feinstein/Murkowski), is intended to simplify this process and allow more projects to receive federal funding.

7.4 Utility Policy Considerations

Developing a recycled water utility may require the City to address a broad range of policy issues related to user participation and cost sharing. Historically the Subregional System has developed its recycled water program on a voluntary basis and has provided rate incentives for participation. As the water supply benefits provided by recycled water are increasingly recognized and local partner agencies work to secure these benefits for their communities, other models for pricing and delivering recycled water need to be considered to address questions such as:

- Who will operate the system?
- Who will pay for the system?
- Who will the customers be?
- Will participation be voluntary or mandatory?
- How will the recycled water be priced?
- Who will operate and maintain the system?

State of California Water and Code

The State of California has very specific findings in the Water Code which guide local agencies regarding the use of recycled water. Water Code section 13550 speaks to the obligation to use recycled water if it is available in the following excerpt: "The Legislature hereby finds and declares that the use of potable domestic water for nonpotable uses, including, but not limited to, cemeteries, golf courses, parks, highway landscaped areas, and industrial and irrigation uses, is a waste or an unreasonable use of the water …"

Perspective on the water supply role of recycled water in California is addressed in section 13511 which reads: "The Legislature finds and declares that a substantial portion of the future water requirements of this state may be economically met by beneficial use of recycled water. The Legislature further finds and declares that the utilization of recycled water by local communities for domestic, agricultural, industrial, recreational, and fish and wildlife purposes will contribute to the peace, health, safety and welfare of the people of the state. Use of recycled water constitutes the development of "new basic water supplies."

Policy and Institutional Alternatives Overview

The following discussion provides a range of alternatives that could be considered by the City as it works to define the policy framework and institutional structure around a recycled water utility.

Who will operate the system? The Subregional System currently operates urban reuse systems with Rohnert Park and Santa Rosa corporate limits. Under this current operational strategy, the Subregional System holds all permits, contracts directly with recycled users, performs all training and oversight functions required by Title 22 of the California Code of Regulations and bills users for recycled water. Currently, the Subregional System functions as a recycled water retailer.

As Cotati, Santa Rosa and Rohnert Park contemplate partnering with the Subregional System to expand urban reuse, this operational model could be retained or the various project partners could develop a different operational model. Namely, the Subregional System could wholesale recycled water to each city and the individual cities would perform retailer responsibilities including customer contracting, training, oversight and billing. This model would require more activity and responsibility for each city, but it would also provide the local water retailer with the opportunity and authority to fully integrate the recycled water resource into its water management strategy. Under this wholesaler-retailer model, the individual cities would have the authority to set rates and fees for recycled water, to mandate its use (if appropriate) and to work directly with customers.

Who will pay for the system? Urban recycled water systems throughout the State are funded in varied ways. Where disposal of treated effluent is the goal, the wastewater utility typically pays for the cost of the system. The Town of Windsor and the Subregional System's current urban irrigation are examples of the wastewater or reclamation utility paying for the cost of the system. Where developing a new water supply is the goal, the water utility typically pays for the cost of the system. Marin Municipal Water District and Redwood City are examples of the water utility funding the system.

This Study has developed a preliminary economic framework which indicates a cost-share between the City's water utility and the Subregional System would result in an equitable allocation of costs and benefits. Implementing this type of cost allocation system would likely require an Agreement between the City and the Subregional System.

Who will the customers be? State law allows the use of recycled water for many urban water uses, including landscape irrigation, car washing, industrial processes, cooling towers, and toilet flushing. For the City, the various alternatives carry different costs. Variables such as proximity to the existing recycled water pipelines, complexity of the customer's on-site system, and the customer's total demand influence the cost effectiveness of each connection.

An urban reuse project would likely be developed first in those parts of the City in close proximity to recycled water sources. The greatest opportunity throughout the City is landscape irrigation. For existing customers that convert to recycled water, good irrigation management practices and systems that keep the water on the landscaped areas would be required; these systems would also need to undergo some retrofit to be suitable for recycled water use.

Will participation be voluntary or mandatory? From State law, any water utility has the authority to require the use of recycled water instead of potable water if recycled water is available. A utility may instead choose to promote the use of recycled water through incentive-based rates or other means. The Subregional System has historically used incentives. The City has the option to mandate connection to the recycled water system.

How will the recycled water be priced? As the recognition that recycled water is a new source of water supply grows, trends state-wide show the price of recycled water becoming closer to the price of potable water. In addition, rate structures that are used on potable systems that include tiers and/or low fixed charges are now being applied to recycled water rates as well as potable rates. The regulatory requirements for minimizing runoff and overspray with recycled water could also be supported by the rates. Table 7-1 is a representative sampling of recycled water rates and rate structures from other utilities.

Table 7-1: Summary of Phasing and Costs including Seasonal Storage

Agency	Potable Rate (per 1,000 gal.)	Recycled Rate (per 1,000 gal.)	Comments
Windsor	$2.02	$0.72–1.62	Potable rate has inclining tiers; recycled differs for residential and non-residential
EBMUD	$2.21-3.35	$2.53	Potable rate has inclining tiers; recycled is greater than lowest potable tier
MMWD	$3.25-12.95	$1.80-7.23	Potable and recycled have inclining tiers; recycled is ~ 55% of potable rate
Fairfield	$2.44	$2.11	Simple commodity rate; recycled is ~ 85% of potable
Redwood City	$1.57-5.75	To be determined	Potable rate has inclining tiers; recycled rate is expected to be 75% of lowest tier

Who operates and maintains the system? The Subregional System has historically operated and maintained its recycled water infrastructure, including the recycled water infrastructure located within the city-limits of Rohnert Park and Santa Rosa, and has essentially functioned as recycled water retailer. Should urban reuse expand within the Subregional System service area, the Subregional System could continue this practice, or it could move to wholesaler-type relationship, where it would contract with the various cities, which would then retail water to their customers. If the City assumed a "retailer" role for recycled water, it would have a better ability to fully integrate this resource into is water supply portfolio; however it would also accept a number of responsibilities for permit compliance and user training, as detailed under Additional User Outreach and Permitting below. Like the issue of cost-sharing, the relationship between the Subregional System as the producer, and the City as the ultimate beneficiary of the water supply, needs to be developed and codified formally through an Agreement.

Table 7-2 summarizes policy issues and alternatives discussed above and provides the City with options to consider if it elects to move forward with an urban reuse project.

Table 7-2: Policy Options – Cotati Urban Reuse Project

Policy/Institutional Topic	Options For Consideration
Funding capital cost of Project	The Project can be funded by the reclamation utility, the water utility, or a combination of both utilities. Combined funding will require an Agreement with the Subregional System. The cost can be born by new users, existing users or some combination of both.
Defining customers	Any water user within the City water utility service area that has use which can be served with recycled water (irrigation, carwash, industrial process, etc) could become a customer. The service area can be as large as the water utility service area or some subset of it.

Policy/Institutional Topic	Options For Consideration
Enlisting customers	Connection to the system can be mandatory for all users, voluntary for all users, or mandatory for some and voluntary for others. New users and existing users do not need to have the same options. Incentives can be used to attract customers.
Demand fees (cost for connection)	The cost to connect to the system can range from zero to as much or more than the cost of connecting to the potable water system. Current potable water users when connecting to recycled water do not have to be treated the same as new users who have never paid a water demand fee.
User rates and rate structure	Based on experience with other urban recycled water systems, the water can cost from very little to as much or more than potable water. The rate structure can be a simple commodity rate, a tiered rate, or a flat fee, and the fixed charge can vary. If the system does not cover its own costs, it will be subsidized by either the water utility or the reclamation utility or both. The rate structure may help achieve regulatory compliance.
Ownership and Operation of Recycled Water Distribution System	The Subregional System could own and operate the recycled water distribution system within the City limits. Alternatively, the Subregional System could wholesale recycled water to the City, who would then operate the retail distribution system within its limits.

7.5 Project Implementation Issues

In addition the policy issues related to bringing a new water source into its service area, the City will need to address project implementation issues such as Environmental Review, User Outreach and Permitting and Project Design. Depending on the decisions made related to system ownership and operation, the City may need to pursue some of these activities as the lead agency, or it may be in a cooperative and supporting role to the Subregional System.

Environmental Review Requirements

Implementation of an urban reuse project would be consistent with the IRWP Master Plan. Approval of policies related to a project that could have direct or indirect environmental effects, as well as construction and operation of a project would be subject to CEQA and require environmental documentation. The policies and project alternatives described in this Feasibility Study are intended to carry out the IRWP Master Plan, and therefore would undergo project-level environmental review that tiers off the Program EIR for the IRWP. This review could be completed by the City as the Lead Agency or by the Subregional System as the Lead Agency.

When the Lead Agency is ready to move forward with a project, it would prepare a Checklist to document the evaluation of the proposed activity and would use the Checklist to determine the appropriate type of tiered environmental review document. If new significant impacts are anticipated, then an EIR must be prepared; if new less-than-significant effects would occur that were not examined in the Program EIR, then a Negative Declaration should be prepared; if no new effects would occur or no new mitigation measures would be required, then the Lead Agency could approve the activity as being within the scope of the Project covered by the Program EIR. In any case, the Lead Agency is required to incorporate feasible mitigation measures developed in the Program EIR into the project-level review. Environmental review of alternatives, cumulative impacts and program-wide mitigation measures have already been developed and evaluated in the Program EIR.

Additional Market Outreach and User Permitting

Market Analysis

The Study Area includes distinct customer bases that could affect the way in which the City pursues its market. Specifically, the Westside System is almost exclusively C/I customers while the Eastside System includes a mix of P/I and Residential Customers. Chapter 4 categorized potential recycled water users into user classes based on land use and potential users' decision-making structure. This was an important step in the outreach process because it provides the City with a systematic way of contacting these users and tracking their responses and concerns. With a clear understanding of potential user profiles, the City could then work with key anchor users to advance recycled water project interests and standards.

The City's implementation strategy should include user surveys to identify any other unique site conditions that would affect program implementation.

User Permitting

The Subregional System has an established water recycling program which it currently implements under a National Pollutant Discharge Elimination System (NPDES) Permit issued by the North Coast Regional Water Quality Control Board (NCRWQCB). The permit functions in a "master producer-user" style, meaning that the Subregional System, not the individual recycled water users, holds the permit from the NCRWQCB. The Subregional System transfers responsibility to the individual users through its User Agreements. The Subregional System's September 2004 Engineering Report for Master Recycling Permit Application (the Title 22 Report), provides a comprehensive listing of the existing system and each customer site.

To connect additional recycled water users, the Subregional System could update its Title 22 Report and secure permit coverage, likely under the existing permit. Alternatively, if the City is ultimately to become the recycled water retailer, it may wish to develop an independent Title 22 Report and secure individual permit coverage. Because the City would only be delivering recycled water to irrigation users, and not discharging recycled water, it could apply for permit coverage under the Porter-Cologne Water Quality Act and receive Water Recycling Requirements (WRRs) or Waste Discharge Requirements (WDRs). A potential advantage to this strategy is that neither WRRs nor WDRs are subject to the Clean Water Act's citizen lawsuit provisions that do apply to NDPES permits.

Regardless of the permitting strategy pursued, connecting new recycled water users will require:

- User Site Reconnaissance Efforts
- User Site Design and Approval Efforts
- User Site Construction and Inspection Efforts
- User Site Supervisor Training

Each of these is described below.

User Site Reconnaissance: This Study provides a feasibility-level analysis but does not include specific user site investigations. The City should investigate the setup of existing landscape irrigation systems to assess feasibility of separating the potable and non-potable uses. Unless

the proposed site is already dual-plumbed for recycled water, detailed cross-connection testing of each customer's system, prior to retrofit construction, would need to be performed. As appropriate for each customer site, detailed reconnaissance should consider the following items:

- Site Characteristics
  - ✓ Type of soil, landscape or crop to be irrigated
  - ✓ Area of recycled water use
  - ✓ Potential areas of overspray, ponding or runoff
  - ✓ Location of existing meters and backflow preventers
  - ✓ Location of drinking fountains, hose bibs and other potable water facilities
  - ✓ Location of picnic tables and playground equipment
  - ✓ Park animals
  - ✓ Appropriate locations for advisory signs
  - ✓ Surrounding land use or other site restrictions (e.g., wells)
  - ✓ Site drainage and sub-drains
- Irrigation Facilities
  - ✓ Irrigation system record drawings (if available)
  - ✓ Potential cross connections between potable and other services
  - ✓ Reservoirs, pumps, strainers, filters, piping and control systems
  - ✓ Valves, quick couplers, irrigation components (e.g., drip or spray)
  - ✓ Number of desired controls
- Customer Management Practices
  - ✓ Maintenance personnel duties and training programs
  - ✓ Irrigation system inspection and repair procedures
  - ✓ Recycled water demands / irrigation schedules / service pressure
  - ✓ Schedule of operation and record keeping (e.g., water application)
  - ✓ Accommodation of events during scheduled irrigation (i.e. evening baseball games)

Available site maps, as-built or record drawings of the existing water use systems should be obtained. Aerial photos and utility maps should be reviewed for utility locations in the general vicinity of the recycled water hook-up.

User Site Design and Approval: The Subregional System is currently developing on-site guidelines for the design, installation and inspection of recycled water facilities. These on-site rules and regulations are expected to address:

- Design Requirements at the Service Connection
  - ✓ Exceptions for Existing Irrigations Systems: Replumbing with purple pipe is not required if appropriate cross connection tests demonstrate complete separation of water systems.
  - ✓ Pressure: the recycled water system needs to provide adequate pressure for irrigation use. The City may wish to have the recycled water system operated at a slightly lower pressure than the potable water system to reduce the potential for cross-connections.

- ✓ Required Wye Strainer and Pressure Regulator: Recycled water may be stored in open ponds prior to delivery and these details will help assure that water quality and pressure always meet the needs of customers.
- ✓ Point of Connection Location: The City will need to provide some oversight and inspection of the recycled water connections. Consistent criteria for connection points will facilitate this oversight.
- ✓ Separation Requirements: DHS has set minimum separation requirements for potable and nonpotable water facilities.
- ✓ Backflow Prevention: Backflow prevention is required by CCR Title 17 for every site that receives both potable and nonpotable water service.

- Design Requirements for On-Site Facilities

  - ✓ No Cross-Connections and Separation Requirements: These on-site requirements should parallel the off-site requirements.
  - ✓ Pipe Class, Depth of Cover and Thrust Blocking: The permit holder (either the Subregional System or the City) is ultimately responsible for leaks on-site and should require designs that will ensure system performance.
  - ✓ Prevention of Overspray, Runoff and Ponding: The permit holder is ultimately responsible for site runoff (though the State Water Board has provided clear guidance on tolerable "Incidental Runoff") and should require designs that will ensure system performance.
  - ✓ Protection of Drinking Fountains and Outdoor Eating Areas: The permit holder is ultimately responsible for the protection of public health and should require designs that will ensure system performance.
  - ✓ Protection of Wellheads: Title 22 of the California Code of Regulations outlines setbacks between recycled water use areas and wellheads. These setbacks are 100-feet for irrigation wells and 500-feet for potable water wells.
  - ✓ Hose Bibs: The recycled water system will need to be adequately marked and equipped with quick-couplers rather than hose bibs to prevent inadvertent use of recycled water for potable purposes.

- Design Approval and Information Required on Plans: The design standards outlined above should be included as required information on all site plans for recycled water users. As required by the NCRWQCB a recycled water use area drawing should be prepared for each customer. These drawings should show the irrigation areas, locations of all public facilities and play areas, and the location of both the potable and recycled water distribution systems as developed during the detailed site reconnaissance. The sketch of each site should be scaled to fit on 11" x 17" sheets.

Site Construction and Inspection: The City should ensure the design standards outlined above are met through an inspection program that covers the following:

- ✓ Pipe Identification
- ✓ Valve Boxes
- ✓ Quick Coupling Valves
- ✓ Other Valves and Devices
- ✓ Identification Tags and Stickers
- ✓ Irrigation Controllers

- ✓ Irrigation and Water Feature Advisory Signs
- ✓ Temporary Connection to Potable Water Service
- ✓ Cross-Connection Test
- ✓ Coverage Test and Final Inspection
- ✓ Record Drawings

The City should conduct a final on-site inspection to satisfy NCRWQCB and Department of Health Services requirements. This inspection will be coordinated with the final cross-connection test and will cover the following:

- ✓ Check for use of proper equipment for retrofit installation
- ✓ Placement of all required tags, labels and onsite signage
- ✓ Check for runoff or windblown spray outside the approved use area
- ✓ Check for ponding of recycled water within the use area
- ✓ Check spray patterns for encroachment on public facilities

Supervisor Training: Each customer would need to designate a Recycled Water Supervisor and a Supervisor Backup to be a liaison with the City, the Subregional System and the regulatory agencies. The City should provide training to each Recycled Water Supervisor and a Supervisor Backup for ongoing operations and maintenance and prevention of potential hazards on the recycled and potable water systems. This could be accomplished through a cooperative program with the Subregional System.

The training sessions would need to address the provisions contained in Title 17 and Title 22 relating to the safe use of recycled water and the maintenance of accurate records; attaining knowledge of basic concepts of backflow and cross-connection prevention, system testing and related emergency procedures; undertaking a preventive maintenance program involving regular inspections of the entire recycled water system; inspection and replacement of all damaged or missing warning signs, tags, stickers, and pipe markings; inspection of spray patterns, possible ponding and runoff: periodic cross-connection testing; maintaining accurate records of all inspections, modifications and repair work; and review of required report submittals to local and state agencies summarizing periodic inspections.

Public Information

Should the City elect to implement an urban reuse project, it would need to communicate the benefits of water recycling to its customers and the community at large. At the early stages of project implementation, the communication does not need to focus on specific project alternatives or phases, but rather it should continue to emphasize the value of all the City's water resources, especially how recycled water has the potential to expand future water supply.

This communication could be integrated with the City's existing customer outreach and education strategies, such as its Web site, various newsletters, utility bill inserts and the IRWP's email broadcast system. Key messages that could be communicated at this time include:

1. Water recycling, like water conservation, is a natural extension of the community's effort to conserve a valuable resource.
2. Water recycling provides major benefits in terms of "drought-proofing" the community's water supply without the need for new water diversions from the environment.

3. Recycled water is safe. The water is highly treated and carefully tested and the production process is approved and monitored by government public health professionals.
4. Many local examples of beneficial water recycling exist, including Finley Park, A Place to Play, Sonoma State University and the Mountain Shadows Golf Course. These local success stories can be linked back to the volume of potable water conserved for potable use.

The City should update the general message regarding recycled water as its project develops.

Design

In addition to the various policy and outreach tasks described above, the project phase would need to be designed, potentially in phases before it could be constructed. Project design would include two distinct activities: predesign and final design.

Predesign

Predesign activities would include detailed hydraulic modeling, evaluation of various pipeline alignments and siting analyses for potential tanks. Predesign activities should be summarized in report form and would result in updated project descriptions and cost estimates that should be coordinated with the CEQA and rate setting processes. Predesign activities should be undertaken for the complete Project (not just the first phase) so that the various interrelated system components can be sized for optimum performance.

Final Design

Final design activities would include the preparation of detailed plans and specifications for each Project phase. Final design may result in multiple bid packages to allow work to be performed most efficiently (i.e., upgrades to the treatment plant or construction of new pump stations may be bid separately from pipeline installations).

Coordination with Caltrans

Based on the alternatives developed in Chapter 6, it is likely that a recycled water system developed in the City would require some construction in Caltrans right-of-way. In September of 2006, the Governor signed Assembly Bill 371 (Goldberg), which provides direction to Caltrans to cooperate with local agencies installing recycled water infrastructure. Appendix 3 includes a sample "Notice to Caltrans" for the City's use.

APPENDIX 1
H2ONET ANALYSIS OF THE ROHNERT PARK URBAN REUSE SYSTEM

Cotati Recycled Water System Hydraulic Analysis

PREPARED FOR: Winzler and Kelly

PREPARED BY: Mahesh Yedluri/CH2M HILL

COPIES: Doug Smith/CH2M HILL

DATE: March 2, 2007

This technical memorandum outlines the preliminary results for the proposed recycled water system for City of Cotati (Cotati). The hydraulic analysis was performed based on the recycled water usage data provided by Winzler and Kelly (W&K). This technical memorandum outlines the transmission main and connection requirements for the proposed recycled water system. The memorandum describes the assumptions, demands, and hydraulic analysis; and then provides conclusions for the system.

Model Assumptions

The following are the assumptions for the hydraulic analysis:

- The proposed users were consolidated into fewer demand nodes for hydraulic analyses purposes. The consolidated number of nodes is 44. The demand node locations are shown on Figure 1
- Only the transmission mains within the proposed system were evaluated; distribution mains to individual customers were not evaluated
- Minimum transmission pipeline size is 8-inch diameter
- Maximum velocity within the pipelines of the proposed system is 5 feet per second
- Minimum pressure within the proposed system is 40 psi
- The transmission main system was established based on the proposed demands provided by W&K, but the transmission main capacity needs to be verified if the demands increase in future
- Water supply to the proposed system will be provided from the existing Rohnert Park reuse system, from the 24-inch pipeline adjacent to Copeland Creek.

System Demands

The hourly demand pattern established for the City of Santa Rosa's Urban Reuse Water System was used for the proposed City's system evaluation. This provides for a peak day

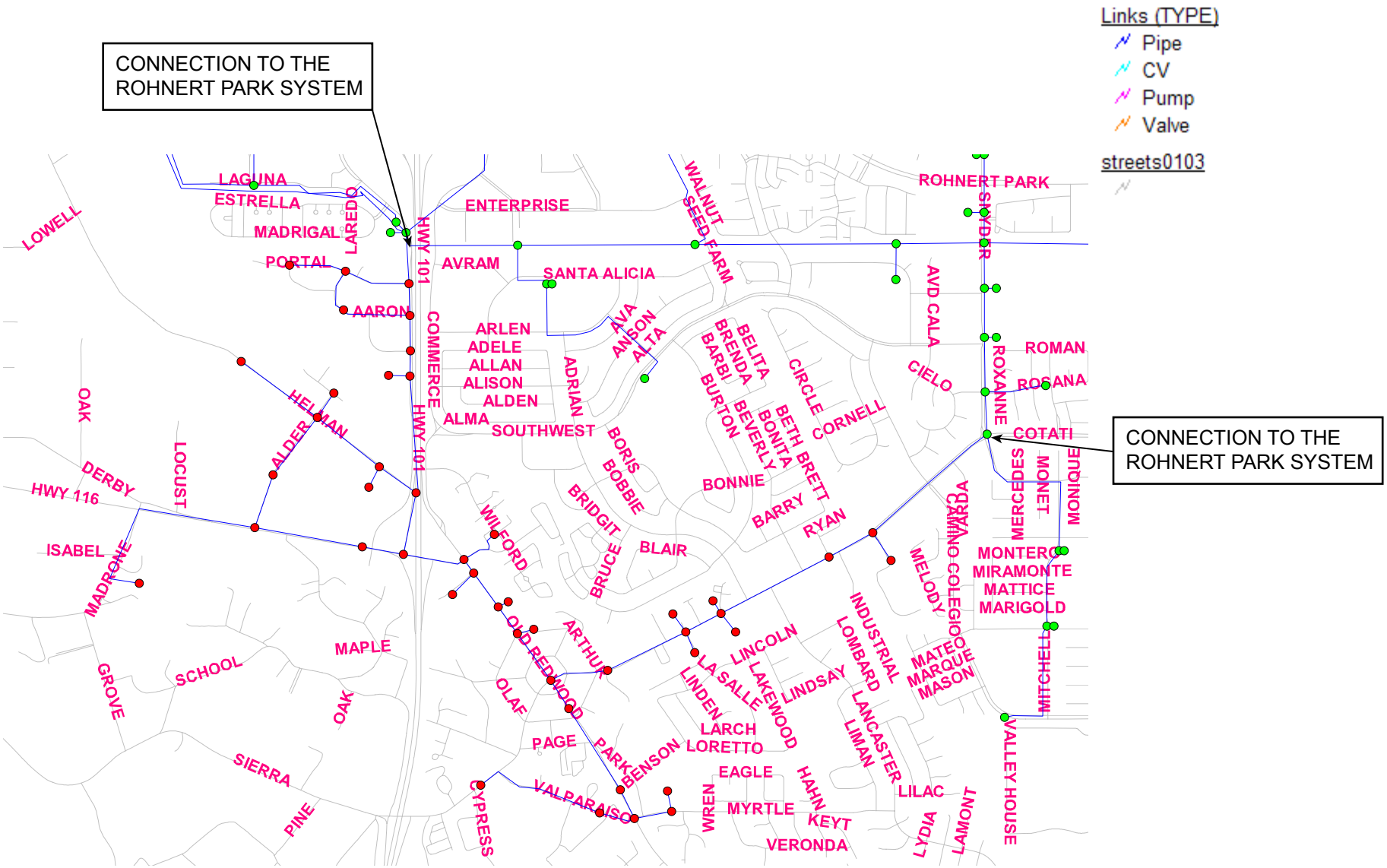


FIGURE 1
Cotati Urban Reuse System Hydraulic Analysis
City of Cotati

demand to average annual demand factor of 2.5:1 and a peak hour demand to peak day demand factor of 4.0:1.

The following demands are therefore calculated for the proposed Cotati distribution system:

- Annual demand: 40 MGY (million gallons per year)
- Maximum day demand: 0.28 mgd (million gallons per day)
- Peak hour demand: 1.1 mgd

Hydraulic Analysis

The system was evaluated based on the assumptions and demands described above. The hourly demand pattern used for the current analysis is shown on Figure 2 of this technical memorandum. This demand pattern was extended for 72 hours for the purpose of hydraulic analysis. The water supply to the proposed system is from the Rohnert Park system as indicated on Figure 1. The analysis of the proposed system provided the following results:

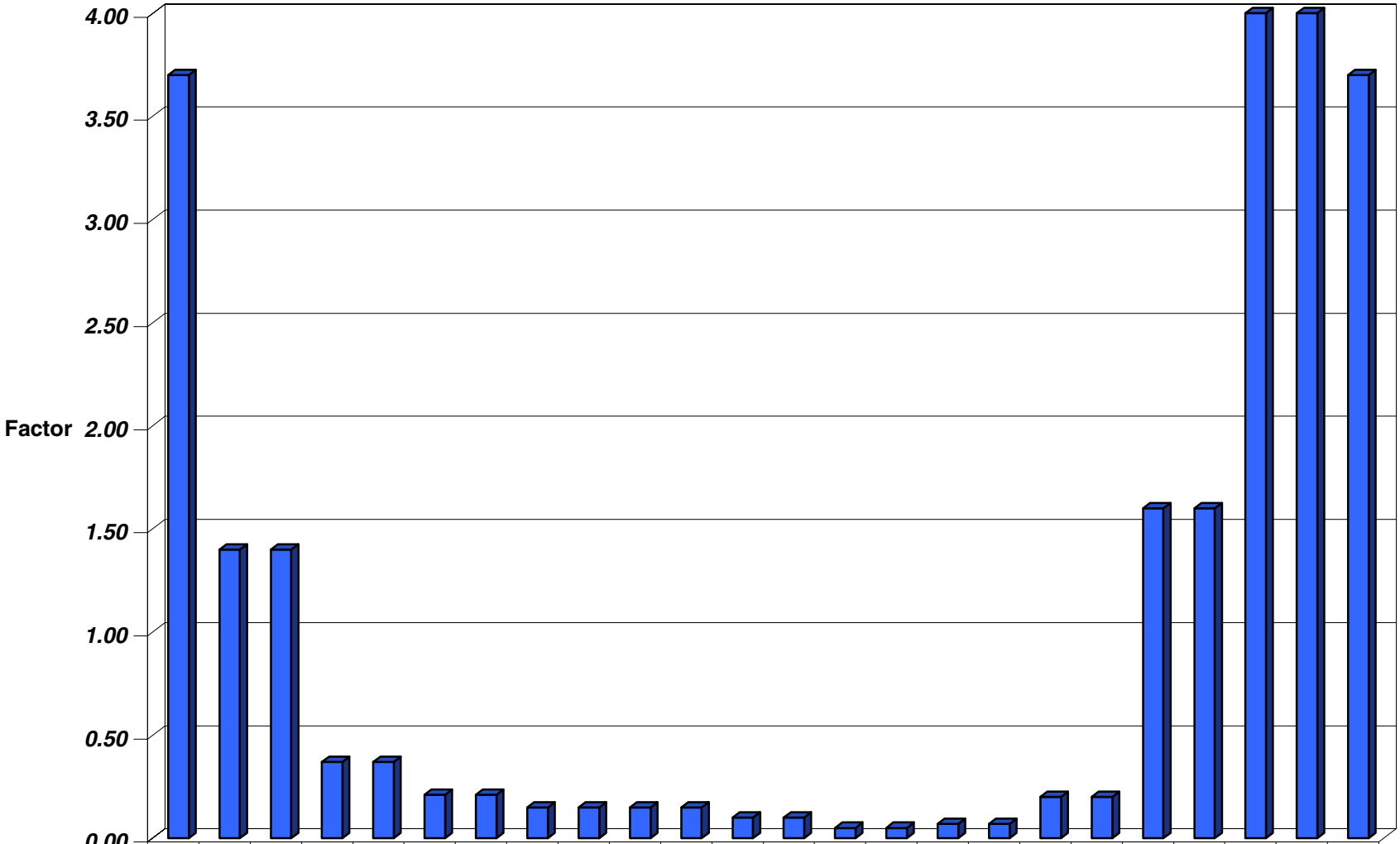
- The transmission mains required to supply recycled water to the proposed City's system consists of 15,500 feet of 8-inch-diameter pipeline.
- Looping the proposed 8-inch transmission main system with the Rohnert Park system on Snyder Lane will marginally benefit the pressures within the proposed system. The low pressure during peak hour at the most easterly Cotati demand node (on East Cotati Ave. near Snyder Lane) without the connection is 56 psi whereas it is 62 psi with the connection between the Cotati and Rohnert Park near Snyder Lane. There is 2 psi drop in pressure within the Rohnert Park system because of this loop. This connection is indicated on Figure 1.

Conclusions

The transmission main system indicated on Figure 1 was sufficient to supply demands to Cotati's proposed recycled water system. If Cotati anticipates demands different from the demands presented within this technical memorandum, the results presented within this technical memorandum need to be verified with the updated demands.

Looping of the Cotati's system with Rohnert Park system will provide slightly better pressures within the Cotati system.

There may be other opportunites to provide looping with the Subregional System's existing reclamation system or the Rohnert Park Reuse system. Many of those options are planned to be investigated as part of the Rohnert Park Urban Reuse expansion project. However, for the purposes of this study, one feasible looping scenario was investigated and shown to be feasible and somewhat beneficial to Cotati. Other scenarios may be beneficial to Cotati, but may provide additional benefits to the Subregional partners (Rohnert Park and Santa Rosa).



	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
Factor	3.70	1.40	1.40	0.37	0.37	0.21	0.21	0.15	0.15	0.15	0.15	0.10	0.10	0.05	0.05	0.07	0.07	0.20	0.20	1.60	1.60	4.00	4.00	3.70

Notes: Demands factors for the 24-Hour Period during the Maximum Day Demand, that is, 1.0 demand factor equates to Maximum Day Demand.

FIGURE 2
24-Hour Demand Pattern Hydraulic Analysis
City of Cotati

Santa Rosa Urban Reuse

Rohnert Park Hydraulics

TO: Marc Solomon
Mary Grace Pawson

COPIES: Don Marske

Ben Romero

FROM: Doug Smith

DATE: December 9, 2005

This memorandum describes the hydraulic capacities available from the Rohnert Park Reuse System for the Santa Rosa Urban Reuse System.

The Wilfred Ave. pipeline was designed for 125 psi operating pressure.

Hydraulic analyses simulated in H2ONET are summarized as follows:

Scenario Description	Inputs	Results
Base	Terre Linda on, Foxtail on, no looping, no new demands, constant head reservoir at Poncia PS supplying both Wilfred Ave. Pipeline (18″) and Rohnert Park Reuse Pipeline (24″). No new south Santa Rosa demand.	P exceeds 65 psi at all locations.
1 – Terre Linda off	Terre Linda demand (1200 gpm) off. New demand for south Santa Rosa (3000 to 5000 gpm).	P drops to 65 psi at Foxtail GC and South SRS at 4000 gpm.
2 – Terre Linda and Foxtail off	Terre Linda and Foxtail (2000 gpm) off. New demand for south Santa Rosa (3000 to 6000 gpm).	P drops to 70 psi to South SRS at 5000 gpm. P drops to 50 psi at 6000 gpm.
3 – Terre Linda and Foxtail off with 12″ loop to Dorotea Park	Terre Linda and Foxtail off. New demand for south Santa Rosa (3000 to 6000 gpm). Add 12″ loop to Dorotea Park.	P results from Scenario 2 improve by 2 psi
4 – Terre Linda and Foxtail off	Terre Linda and Foxtail off. New demand for south Santa Rosa	P is sustained in south SRS up to 7000 gpm with 64 psi. Foxtail P is 96 psi, so

with loop to Copeland Creek	(3000 to 7000 gpm). Add 18" or 24" loop to Copeland Creek.	south SRS P could easily be designed to exceed 65 psi. 24" loop adds 3 psi.
5 – Add new developer demands for RP, turn off Terre Linda and Foxtail, add 24" connector to Copeland Creek.	Terre Linda and Foxtail off. New demand for south Santa Rosa at 7000 gpm (10 mgd). Add 24" loop to Copeland Creek. Add new 300 AF reservoir with pump station at Petaluma Hill Rd and RP XPWY. New RP parks on. All new RP SPAs on.	NW SPA and Wilfred Dowdell SPA consume 3000 gpm of 5000-gpm Wilfred Pipeline capacity. Of 7000 gpm total to south Santa Rosa, 1225 gpm is supplied by Wilfred Pipeline and 5775 gpm comes via the new connector up from Copeland Creek 24" mainline. Poncia PS operates at 8550 gpm (12 mgd), and Pet. Hill PS operates at 15,450 gpm (22 mgd).

Conclusions

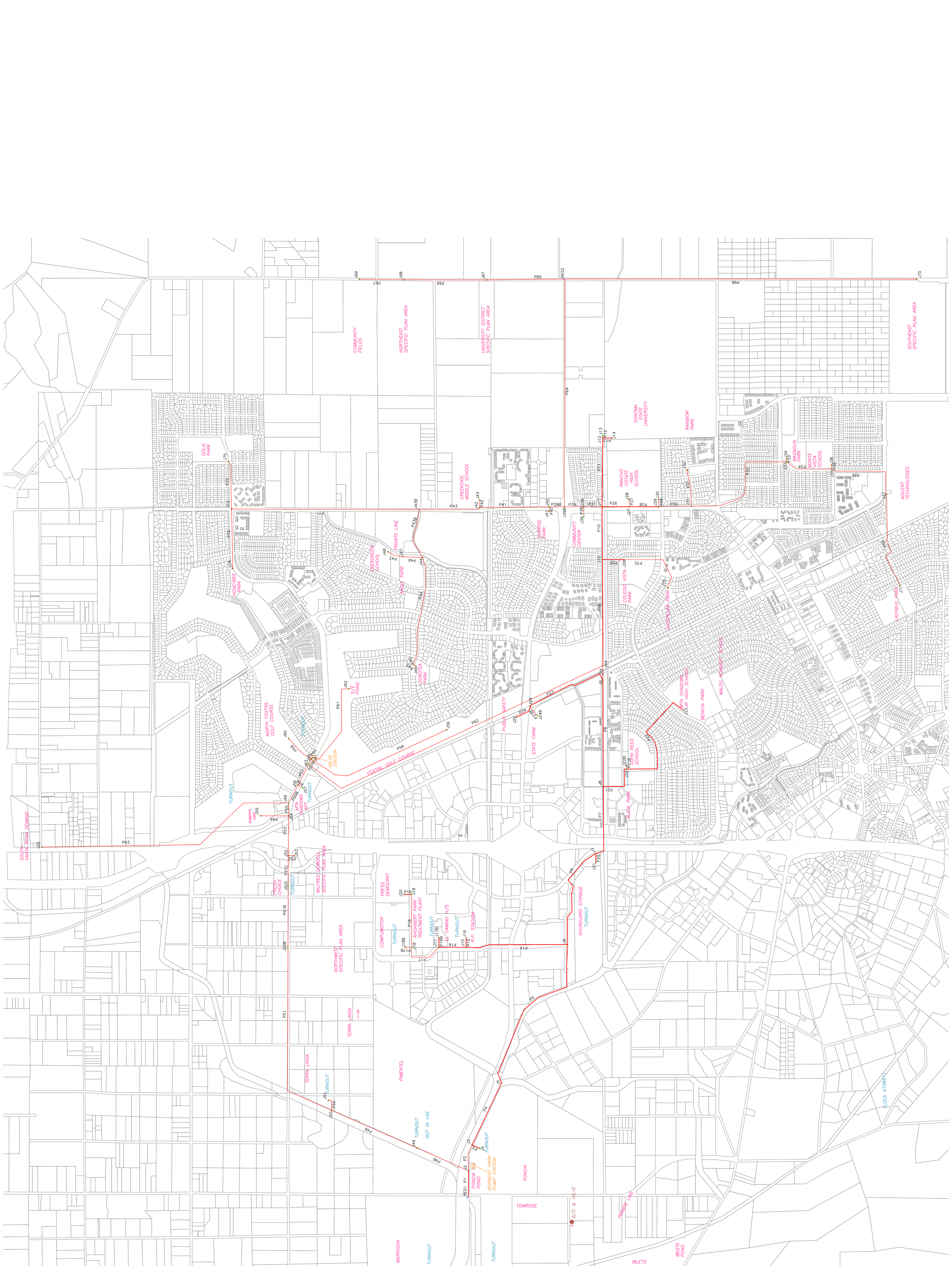
Without New Developer Demands in Rohnert Park:

1. With Terre Linda off, 3000 to 4000 gpm is possible to South SRS.
2. With Terre Linda and Foxtail off, 5000 gpm (about 7 mgd) is possible.
3. Loop to Dorotea is not advised.
4. Loop to Copeland Creek could increase flows to 7000 gpm with 18" size. Length is 7700'. Estimated cost is $1.46 million based upon the standard cost assumptions used in ADM. Flow benefit estimated at 2000 gpm.

With New Developer Demands in Rohnert Park:

1. Up to 7000 gpm (10 mgd) could be supplied to south Santa Rosa with new PS at Peteluma Hill Reservoir, and 24" connector to Copeland Creek.
2. With addition of Northwest SPA and Wilfred Dowdell SPA onto the Wilfred Pipeline, 3000 gpm of its 5000-gpm capacity are consumed. This leaves approximately 2000 gpm (about 3 mgd) of capacity that would be available if no connector is installed between the existing 24" and 18" mainlines.
3. The above conclusions assume that both Terre Linda and Foxtail use daytime irrigation or pond filling.
4. The flow benefit of the new 24" connector under this scenario is the difference between 7000 gpm and 2000 gpm. The connector becomes more significant with developer demands included because much of the Wilfred pipeline capacity is consumed by the development in northwest Rohnert Park. Estimated cost of the 7700' of 24" pipeline is $1.89 million, again using the ADM costing guidelines.
5. The above scenarios assume that adequate capacity is established at the Petaluma Hill Reservoir, assumed to have 300 AF (98 MG) capacity. Under Scenario 5, its pump station would empty the reservoir at 15,450 gpm. An 8-hour volume at this

rate is 7.4 MG, so the reservoir would be emptied in 13 days without refilling. However, the reservoir could be refilled from the existing 24" mainline which does not currently have any daytime demands. Assuming 16 hours of refilling time available and a capacity of 8000 gpm on the mainline, the system could essentially stay in balance because the refill rate is half the withdrawal rate but there is twice as much time to fill. The 13 days of storage would then become an operational buffer. A significant pump station, approaching 1500 HP, would be required at Petaluma Hill to provide this flow. In addition, the Poncia PS operational parameters would change. By night, it would serve in its current function of providing water at sprinkler pressure into Rohnert Park. By day, it would serve to boost flow from the Laguna plant into the Petaluma Hill Rd. reservoir, which would be a much lower head operation.


COMMUNITY FIELDS
NORTHEAST SPECIFIC PLAN AREA
UNIVERSITY DISTRICT SPECIFIC PLAN AREA
SOUTHEAST SPECIFIC PLAN AREA
SONOMA STATE UNIVERSITY
RAINBOW PARK
GOLIS PARK
CREEKSIDE MIDDLE SCHOOL
RANCHO COTATE HIGH SCHOOL
MAGNOLIA PARK
MONTE VISTA SCHOOL
AGILENT TECHNOLOGIES
SUNRISE PARK
COMMUNITY CENTER
PRIVATE LINE
EVERGREEN SCHOOL
EAGLE PARK
HONEYBEE PARK
COLEGIO VISTA PARK
CATERPILLAR PARK
LADYBUG PARK
DOROTEA PARK
S/E POND
NORTH FOXTAIL GOLF COURSE
TURNOUT
VALVE STATION
FOXTAIL GOLF COUSSE
PUBLIC SAFETY
STATE FARM
MTN SHADOWS JR HIGH SCHOOL
BENICIA PARK
WALDO ROHNERT SCHOOL
JOHN REED SCHOOL
ALICIA PARK
SOUTH SANTA ROSA DEMAND
ROBERTS LANE
MTN SHADOWS APT
FRESH CHOICE
WILFRED LOWDELL SPECIFIC PLAN AREA
PRESS DEMOCRAT
COMPUMOTOR
RHOHNERT PARK TREATMENT PLANT
H/S
EL CAMINO
R.P. STADIUM
SHURGUARD STORAGE
NORTHWEST SPECIFIC PLAN AREA
TERRA LINDA
PIMENTEL
NOT IN USE
PONCIA POND
ROHNERT PARK PUMP STATION
PONCIA
TOMROSE
B/O & VALVE
PRIVATE LINE
IBLETO
IBLETO POND
MORRISON
(LOCA 470861)
US 101
J69
J68
J67
RES2
J70
P65
P66
P67
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P64
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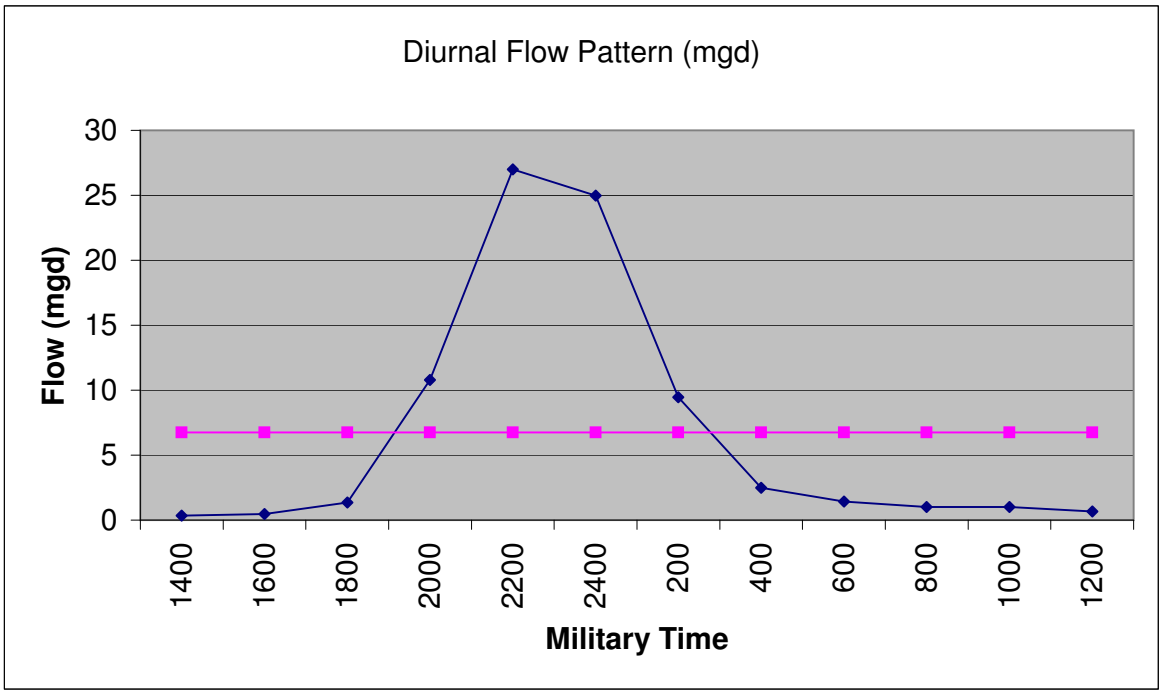
P8
P7
P6
P5
P4
P3
P2
P1
RES1

APPENDIX 2
STORAGE TANK SIZING CALCULATIONS

Santa Rosa Recycled Water Storage--Diurnal Demand Curve and Storage Volume ADD 6.75 mgd

Percent Demand	Time (Military)	Fill Rate (mgd)	Demand (mgd)	Cumulative Volume (MG)	Storage In/Out (MG)	Storage Volume (MG)	Estimated Storage, MG
0.05	1400	6.75	0.34	0	0.53	2.80	
0.07	1600	6.75	0.47	0.03	0.52	3.32	
0.20	1800	6.75	1.35	0.11	0.45	3.77	← size @ 3.8 MG
1.60	2000	6.75	10.80	0.62	-0.34	3.43	
4.00	2200	6.75	27.00	2.19	-1.69	1.74	
3.70	2400	6.75	24.98	4.36	-1.52	0.22	
1.40	200	6.75	9.45	5.79	-0.23	0.00	
0.37	400	6.75	2.50	6.29	0.35	0.35	
0.21	600	6.75	1.42	6.45	0.44	0.80	
0.15	800	6.75	1.01	6.55	0.48	1.28	
0.15	1000	6.75	1.01	6.64	0.48	1.76	
0.10	1200	6.75	0.68	6.71	0.51	2.26	
				6.75			



APPENDIX 3
SAMPLE "NOTICE TO CALTRANS" UNDER AB 371

Date

Name
Address
City State ZIP

Re: Notice of Intent to Provide Recycled Water

Dear _____:

In accordance with Section 13555.5 of the Water Code, the City of Cotati is providing notice that intends to deliver recycled water along the Highway 10 and Highway 116 corridors within its City limits.

Such deliveries are expected to occur with the next ten (10) years. In accordance with Section 13555.5 of the Water Code, all irrigation piping installed by the California Department of Transportation shall comply with Title 22 of the California Code of Regulations and shall be suitable for use with recycled water.

The City looks forward to the opportunity to coordinate with Caltrans in developing a sustainable water supply for the City.

APPENDIX E – WATER SHORTAGE CONTINGENCY ORDINANCE

Chapter 13.30 - WATER SHORTAGE CONTINGENCY PLAN*

Sections:

* Prior ordinance history: Ord. 705.

13.30.010- Scope.

There is established a city water shortage contingency plan.

(Ord. 778 § 1(part), 2005).

13.30.020- Declaration of policy.

It is declared that, because of the conditions prevailing in the city and in the county of Sonoma, the public health, safety, and welfare requires that the water resources available to the city be put to the maximum beneficial use to the extent to which they are capable, to promote water conservation and the efficient use of potable water furnished by the city, by eliminating intentional or unintentional water waste when a reasonable alternative solution is available, and by prohibiting use of equipment which is wasteful.

(Ord. 778 § 1(part), 2005).

13.30.030- Definitions.

As used in this chapter:

"City" means the city of Cotati acting by and through the city of Cotati public works department as operator of the city of Cotati water system.

"Customer" means any person, whether within or without the geographic boundaries of the city of Cotati, who uses water supplied by the city.

"GPD" means gallons per day.

"Manager" means the public works manager of the city of Cotati.

"Person" means any person, firm, partnership, association, corporation, company, organization, or governmental entity.

(Ord. 778 § 1(part), 2005).

13.30.040- Authorization.

The city manager or his/her designee, is authorized and directed to implement the applicable provisions of this chapter upon determination that such implementation is necessary to protect the public health, safety, and welfare.

(Ord. 778 § 1(part), 2005).

13.30.050- Application.

The provisions of this chapter shall apply to all persons, customers, and property served by the city.

(Ord. 778 § 1(part), 2005).

13.30.060- Water waste prohibitions.

A. Nonessential Uses. No customer of the city shall use or permit the use of potable water from the city for residential, commercial, institutional, industrial, agricultural, or other purpose for the following nonessential uses:

1. The washing of sidewalks, walkways, driveways, parking lots and other hard-surfaced areas by direct hosing, except as may be necessary to properly dispose of flammable or other dangerous liquids or substances, wash away spills that present a trip and fall hazard, or to prevent or eliminate materials dangerous to the public health and safety;

2. The escape of water through breaks or leaks within the customers plumbing or private distribution system for any substantial period of time within which such break or leak should reasonably have been discovered and corrected. It shall be presumed that a period of seventy-two hours after the customer discovers such a break or leak or receives notice from the city, is a reasonable time within which to correct such break or leak or, at a minimum, to stop the flow of water from such break or leak;

3. Irrigation in a manner or to an extent which allows excessive runoff of water or unreasonable over-spray of the areas being watered. Every customer is deemed to have his/her water system under control at all times, to know the manner and extent of his/her water use and any runoff, and to employ available alternatives to apply irrigation water in a reasonably efficient manner;

4. Washing cars, boats, trailers or other vehicles and machinery directly with a hose not equipped with a shutoff nozzle;

5. Water for nonrecycling decorative water fountains;

6. Water for single pass evaporative cooling systems for air conditioning in all connections installed after the effective date of the ordinance codified in this chapter, unless required for health or safety reasons;

7. Water for new nonrecirculating conveyor car wash systems; and

8. Water for new nonrecirculating industrial clothes wash systems.

B. Exempt Water Uses. All water use associated with the operation and maintenance of fire suppression equipment or employed by the city for water quality flushing and sanitation purposes shall be exempt from the provisions of this section. Use of water supplied by a private well or from a reclaimed wastewater, grey water or rainwater utilization system is also exempt.

(Ord. 778 § 1(part), 2005).

13.30.070- Water conservation stages.

No customer of the city shall knowingly make, cause, use, or permit the use of water from the city for residential, commercial, industrial, agricultural, governmental, or any other purpose in a manner contrary to any provision of this chapter, or in an amount in excess of that use permitted by either Conservation Stage 2 or 3 when in effect as declared by separate resolution of the city council, in accordance with the provisions of this chapter.

A. Stage 1. Voluntary Conservation. In order to achieve an overall system-wide reduction goal of ten percent, all potable water customers of the city are requested to:

1. Apply irrigation water only during the evening and early morning hours to reduce evaporation losses;

2. Inspect all irrigation systems, repair leaks, and adjust spray heads to provide optimum coverage and eliminate avoidable over-spray;

3. For irrigation valves controlling water applied to lawns, vary the minutes of run-time

consistent with fluctuations in weather;

4. Reduce minutes of run-time for each irrigation cycle if water begins to run off to gutters and ditches before the irrigation cycle is completed;
5. Become conversant with and strictly adhere to the city's water waste prohibition ordinance;
6. Utilize water conservation rebate and giveaway programs to replace water guzzling plumbing fixtures and appliances with water-efficient models;
7. Utilize city information regarding using water efficiently, reading water meters, repairing ordinary leaks, and how to make your landscape a water-efficient landscape.

B. Stage 2. Mandatory Compliance—Water Alert. The city council may by resolution declare a Conservation Stage 2 upon recommendation by the city manager based on water supply and delivery projections by the city engineer that an overall system-wide reduction of twenty percent is necessary, taking into consideration projections and estimates made by the Sonoma County Water Agency pertaining to the Russian River water supply. In order to achieve an overall system-wide reduction of twenty percent, the following activities shall be prohibited:

1. Nonessential uses of water, including the following:
   a. Refilling or initial filling of a swimming pool,
   b. Noncommercial washing of privately owned motor vehicles, trailers and boats except from a bucket and except that a hose equipped with a shutoff nozzle may be used to rinse the vehicle,
   c. Any use of water from a fire hydrant except for fighting fires or essential construction needs,
   d. Use of potable water for dust control at construction sites;
2. The city council shall have the authority to prohibit other activities and water uses upon the recommendation of the city manager that such additional measures are necessary to achieve an overall system-wide reduction of twenty percent in water usage.

C. Stage 3. Mandatory Compliance—Water Emergency. The city council may by resolution declare a Conservation Stage 3 upon recommendation by the city manager based on water supply and delivery projections by the city engineer that an overall system-wide reduction of thirty percent is necessary, taking into consideration projections and estimates made by the Sonoma County Water Agency pertaining to the Russian River water supply. In order to achieve an overall system-wide reduction of thirty percent, the following activities shall be prohibited:

1. Any activities prohibited during a Conservation Stage 2;
2. Watering any residential lawn, or any commercial or industrial area lawn irrigated with potable water, at any time, day or night.
3. Planting any new landscaping, except for drought-resistant landscaping;
4. All day and night-time irrigation sprinkling unless only a hand-held nozzle is used. An exception will be made to permit drip irrigation for established perennial plants and trees using manual or automatic time-controlled water application;
5. Planting of new annual plants, vegetables, flowers or vines may not occur until the Stage 3 emergency is over;
6. The city council shall have the authority to prohibit other activities and water uses upon the recommendation of the city manager that such additional measures are necessary to achieve an overall system-wide reduction of thirty percent in water usage.

(Ord. 778 § 1(part), 2005).

13.30.080- Exceptions and application procedures for exceptions.

Any customer of the city may make written application for an exception. Such application shall describe in detail why applicant believes an exception is justified.

A. The manager may grant exceptions for use of water otherwise prohibited by this section upon finding and determining that failure to do so would cause an emergency condition affecting the health, sanitation, fire protection or safety of the applicant or public; or, cause an unnecessary and undue hardship on applicant or the public, including but not limited to, adverse economic impacts, such as loss of production or jobs.

B. The decision of the manager may be appealed to the city council by submitting a written appeal to the city clerk within fifteen calendar days of the date of the decision. Upon granting any appeal, the city council may impose any conditions it determines to be just and proper. Exceptions granted by

the city council shall be prepared in writing and the city council may require the exception be recorded at applicant's expense.

(Ord. 778 § 1(part), 2005).

13.30.090- Violation—Enforcement.

The violation of each provision of this chapter, and each separate violation thereof, shall be deemed a separate offense, and shall be enforced as an infraction punishable by a fine in the amount provided by Government Code Section 36900, as amended. The city may, after written notification to customer and a reasonable time to correct the violation as solely determined by the city, take some or all of the following actions. Fees and charges for the activities below shall be established by resolution of the city council.

A. Written notice to the customer of the water waste violation including a specified period of time to correct the violation;

B. Personal contact with the customer at the address of the water service. If personal contact is unsuccessful, written notice of the violation including a date that the violation is to be corrected may be left on the premises, with a copy of the notice sent by certified mail to the customer;

C. After notice and a hearing provided in accordance with Section 13.30.100 of this chapter, the city council may authorize the installation of a flow-restricting device on the service line and require payment of a fee in the amount set by city council resolution;

D. The city council may levy a water waste fee to the customer, such fee established by separate ordinance;

E. After notice and a hearing provided in accordance with Section 13.30.100 of this chapter, the city council may authorize termination of water service, if such action is deemed by the city attorney to be allowable under statutory requirements at the time, and the charge for same shall be billed to the customer. Except in cases of extreme emergency as solely determined by the manager, service shall not be reinstated until verified by the manager that the violation has been corrected and all charges and fees have been paid.

(Ord. 778 § 1(part), 2005).

13.30.100- Notice and hearing.

Before either installing a water restrictor or terminating water service, a hearing shall be scheduled before the city council with notice provided to the property owner and the resident of the property of the time, date and place of the hearing. Such notice shall be provided at least ten days prior to the hearing date. At the hearing, the city council shall hear testimony from all interested persons and shall make a determination as to whether a water flow-restricting device should be installed or water service terminated. If the city council determines that a water-flow restricting device should be installed, the city council shall establish a date by which such device must be installed. The city council may also provide that if the water flow-restricting device is not installed by the date provided, the city manager may have the water flow-restricting device installed and the cost of such installation paid by the property owner and/or resident of the property. If the property owner and/or resident does not pay these installation costs after being billed for such costs by the city manager, the city manager may utilize the procedures contained in Sections 9.100.090 and 9.100.100 of this code to recoup the city's installation costs.

(Ord. 778 § 1(part), 2005).

13.30.110- Violation—Additional remedy.

As an additional remedy, the violation of any provision of this chapter shall be deemed, and is declared to be, a public nuisance and may abate in accordance with Chapter 9.100 of the city of Cotati Municipal Code.

(Ord. 778 § 1(part), 2005).

APPENDIX F – CUWCC BMP ANNUAL REPORTS

The fields in red are required.

Agency name: City of Cotati

Reporting unit name (District name): City of Cotati

Reporting unit number: 6015

Primary contact:

First name: Damien

Last name: O'Bid

Email: dobid@ci.cotati.ca.us

You must enter the reporting unit number that we have on record for your agency. Click here to open a table to obtain this number.

Link to FAQs

2010

BMP 1.1 Operations Practices

Comments:

See the complete MOU: View MOU

See the coverage requirements for this BMP:

Conservation Coordinator

Conservation Coordinator ◯ Yes ◯ No

Contact Information

First Name	Kevin
Last Name	Fredrickson
Title	Engineering Technician
Phone	7076654238
Email	kfredrickson@ci.cotati.ca.us

Note that the contact information may be the same as the primary contact information at the top of the page. If this is your case, excuse the inconvenience but please enter the information again.

Water Waste Prevention

Water Agency shall do one or more of the following:

a. Enact and enforce an ordinance or establish terms of service that prohibit water waste
b. Enact and enforce an ordinance or establish terms of service for water efficient design in new development
c. Support legislation or regulations that prohibit water waste
d. Enact an ordinance or establish terms of service to facilitate implementation of water shortage response measures
e. Support local ordinances that prohibit water waste
f. Support local ordinances that establish permits requirements for water efficient design in new

To document this BMP, provide the following:

a. A description of, or electronic link to, any ordinances or terms of service
b. A description of, or electronic link to, any ordinances or requirements adopted by local jurisdictions or regulatory agencies with the water agency's service area.
c. A description of any water agency efforts to cooperate with other entities in the adoption or enforcement of local requirement
d. description of agency support positions with respect to adoption of legislation or regulations

You can show your documentation by providing files, links (web addresses), and/or entering a description.

File name(s): Email files to natalie@cuwcc.org

Web address(s) URL: comma-separated list: http://library.municode.com/index.aspx?clientId=16297&stateId=5&stateName=California

Enter a description:: Chapter 13.30 Water Shortage Contingency Plan

The fields in red are required.

Agency name: City of Cotati

Reporting unit name (District name): City of Cotati

Reporting unit number: 6015

Primary contact:

First name: Damien

Last name: O'Bid

Email: dobid@ci.cotati.ca.us

You must enter the reporting unit number that we have on record for your agency. Click here to open a table to obtain this number.

Link to FAQs

2010 BMP 1.2 Water Loss Control

View MOU

AWWA Water Audit

Agency to complete a Water Audit & Balance Using The AWWA Software ◉ Yes ○ No

Email to natalie@cuwcc.org - Worksheets (AWWA Water Audit). Enter the name of the file below:

COCotati_Retail_6015_2010_BMP_1-2_AWWA.xls

Water Audit Validity Score from AWWA spreadsheet: 81

Agency Completed Training In The AWWA Water Audit Method ○ Yes ◉ No

Agency Completed Training In The Component Analysis Process ○ Yes ◉ No

Completed/Updated the Component Analysis (at least every 4 years)? ○ Yes ◉ No

Component Analysis Completed/Updated Date:

Water Loss Performance

Agency Repaired All Reported Leaks & Breaks To The Extent Cost Effective ◉ Yes ○ No

Recording Keeping Requirements:

Date/Time Leak Reported	Leak Location
Type of Leaking Pipe Segment or Fitting	Leak Running Time From Report to Repair
Leak Volume Estimate	Cost of Repair

Agency Located and Repaired Unreported Leaks to the Extent Cost Effective ◉ Yes ○ No

Type of Program Activities Used to Detect Unreported Leaks

Daily visual checks while driving through areas of the City paying attention to wet or unusually green spots. Visual check and listening for noises during meter reading activities.

Annual Summary Information

Complete the following table with annual summary information (required for reporting years 2-5 only)

Total Leaks Repaired	Economic Value Of Real Loss	Economic Value Of Apparent Loss	Miles Of System Surveyed For Leaks	Pressure Reduction Undertaken for loss reduction	Cost Of Interventions	Water Saved (AF/Year)
13	$78.51	$115.32	27.7		$13,000.00	0.13

Comments: Real Loss=Cost of imported water from SCWA, Apparent Loss=What a customer would have paid for that amount of water Water Saved is actually the water lost due to leaks

The fields in red are required.

Agency name: City of Cotati

Reporting unit name (District name): City of Cotati

Reporting unit number: 6015

Primary contact:

First name: Damien

Last name: O'Bid

Email: dobid@ci.cotati.ca.us

You must enter the reporting unit number that we have on record for your agency. Click here to open a table to obtain this number.

BMP 1.3 Metering with Commodity

2010

Link to FAQs

See the complete MOU: View MOU

See the coverage requirements for this BMP:

Implementation

Does your agency have any unmetered service connections? Yes No

If YES, has your agency completed a meter retrofit plan? Yes No

Enter the number of previously unmetered accounts fitted with meters during reporting year:

Are all new service connections being metered? Yes No

Are all new service connections being billed volumetrically? Yes No

Has your agency completed and submitted electronically to the Council a written plan, policy or program to test, repair and replace meters? Yes No

Please Fill Out The Following Matrix

Account Type	# Metered Accounts	# Metered Accounts Read	# Metered Accounts Billed by Volume	Billing Frequency Per Year	# of estimated bills/yr
Single-Family	2,112	2,112	2,112	Bi-monthly	0
Multi-Family	106	106	106	Bi-monthly	0
Commericial	167	167	167	Bi-monthly	0
Dedicated Irrigatic	141	141	141	Bi-monthly	0
Other	47	47	47	Bi-monthly	0
Other				Other	
Other				Other	
Other				Other	
Other				Other	
Other				Other	

Number of CII Accounts with Mixed-use Meters: 84

Number of CII Accounts with Mixed-use Meters Retrofitted with Dedicated Irrigation Meters during Reporting Period: 0

Feasibility Study

Has your agency conducted a feasibility study to assess the merits of a program to provide incentives to switch mixed-use accounts to dedicated landscape meters? Yes No

If YES, please fill in the following information:

A. When was the Feasiblity Study conducted

B. Describe, upload or provide an electronic link to the Feasibility Study Upload File

File name(s): Email files to natalie@cuwcc.org

Web address(s) URL: comma-separated list

Comments:

The fields in red are required.

Agency name: City of Cotati

Reporting unit name (District name): City of Cotati

Reporting unit number: 6015

Primary contact:

First name: Damien

Last name: O'Bid

Email: dobid@ci.cotati.ca.us

You must enter the reporting unit number that we have on record for your agency. Click here to open a table to obtain this number.

CUWCC

2010

Link to FAQs

View MOU

BMP 1.4 Retail Conservation Pricing

If you are reporting more rate structures than this form allows, add the structures to a spreadsheet and send the file to natalie@cuwcc.org.

Implementation (Water Rate Structure)

Enter the Water Rate Structures that are assigned to the majority of your customers, by customer class

Rate Structure	Customer Class	Total Revenue Commodity Charges	Total Revenue Customer Meter/Service (Fixed Charges)
Uniform	Single-Family	409,298.00	362,382.00
Uniform	Multi-Family	99,528.00	47,871.00
Uniform	Commercial	86,028.00	54,386.00
Uniform	Dedicated Irrigation	90,444.00	46,805.00
Uniform	Other	27,478.00	23,055.00
Select a Rate Struc	Other		
Select a Rate Struc	Other		

Implementation Option (Conservation Pricing Option)

- ○ Use Annual Revenue As Reported
- ○ Use Canadian Water & Wastewater Association Rate Design Model

If CWWA is select, enter the file name and email the spreadsheet to natalie@cuwcc.org

Retail Waste Water (Sewer) Rate Structure by Customer Class

Agency Provide Sewer Service ○ Yes ○ No

Select the Retail Waste Water(Sewer) Rate Structure assigned to the majority of your customers within a specific customer class.

Rate Structure	Customer Class	Total Revenue Commodity Charges	Total Revenue Customer Meter/Service (Fixed Charges)
Uniform	Single-Family	929,903.00	829,027.00
Uniform	Commercial	177,124.00	123,877.00
Select a Rate Struc	Other		
Select a Rate Struc	Other		
Select a Rate Struc	Other		
Select a Rate Struc	Other		
Select a Rate Struc	Other		

Comments:

The fields in red are required.

Agency name: City of Cotati

Reporting unit name (District name): City of Cotati

Reporting unit number: 6015

Primary contact:

First name: Damien

Last name: O'Bid

Email: dobid@ci.cotati.ca.us

Click here to open a table that displays your agency name reporting unit name and reporting unit number. Please ensure that you enter the correct information.

Link to FAQs

2010

BMP 2.1 Public Outreach - Retail Reporting

View MOU

Is a Wholesale Agency Performing Public Outreach?

Are there one or more wholesale agencies performing public outreach which can be counted to help your agency comply with the BMP? ○ Yes ○ No

Enter the name(s) of the wholesale agency (comma delimited)

Sonoma County Water Agency

Is your agency performing public outreach?

Report a minimum of 4 water conservation related contacts your agency had with the public during the year.

Public Information Programs List

Did at least one contact take place during each quarter of the reporting year? ☐

Number of Public Contacts		Public Information Programs	
	Flyers and/or brochures (total copies), bill stuffers, messages printed on bill, information packets		
	Newsletter articles on conservation		
	General water conservation information		
	Website		
	Select a public contact		

Contact with the Media

Are there one or more wholesale agencies performing media outreach which can be counted to help your agency comply with the BMP? ○ Yes ○ No

Enter the name(s) of the wholesale agency (comma delimited)

OR Retail Agency (Contacts with the Media)

Media Contacts List

Did at least one contact take place during each quarter of the reporting year? ☐

Number of Media Contacts	Did at least one contact take place during each quarter of the reporting year?	Media Contact Types	
	Radio contacts		
	Newspaper contacts		
	Select a type of media contact		
	Select a type of media contact		
	Select a type of media contact		
	Select a type of media contact		

Is a Wholesale Agency Performing Website Updates?

Did one or more CUWCC wholesale agencies agree to assume your agency's responsibility for meeting the requirements of and for CUWCC reporting of this BMP? ○ Yes ○ No

Enter the name(s) of the wholesale agency (comma delimited)

Is Your Agency Performing Website Updates?

Enter your agency's URL (website address): www.ci.cotati.ca.us

Describe a minimum of four water conservation related updates to your agency's website that took place during the year:

Did at least one Website Update take place during each quarter of the reporting year? ○ Yes ○ No

Public Outreach Annual Budget

Enter budget for public outreach programs. You may enter total budget in a single line or brake the budget into discrete categories by entering many rows. Please indicate if personnel costs are included in the entry.

Category	Amount		Personnel Costs Included? If yes, check the box.	Comments	

Comments:

The fields in red are required.

Agency name: City of Cotati

Reporting unit name (District name): City of Cotati

Reporting unit number: 6015

Primary contact:

First name: Damien

Last name: O'Bid

Email: dobid@ci.cotati.ca.us

Click here to open a table that displays your agency name reporting unit name and reporting unit number. Please ensure that you enter the correct information.

Link to FAQs

2010

BMP 2.1 Public Outreach Cont'd

View MOU

Public Outreach Expenses

Enter expenses for public outreach programs. Please include the same kind of expenses you included in the question related to your budget (Section 2.1.7, above). For example, if you included personnel costs in the budget entered above, be sure to include them here as well.

Expense Category	Expense Amount	Personnel Costs Included?	
			If yes, check the check box.

Additional Public Information Program

Please report additional public information contacts. List these additional contacts in order of how your agency views their importance / effectiveness with respect to conserving water, with the most important/ effective listed first (where 1 = most important).

Were there additional Public Outreach efforts? ○ Yes ○ No

Public Outreach Additional Information

Public Information Programs	Importance	
Newsletter articles on conservation		
Newsletter articles on conservation		
General water conservation information		

Social Marketing Programs

Branding

Does your agency have a water conservation "brand," "theme" or mascot? ○ Yes ○ No

Describe the brand, theme or mascot.

Market Research

Have you sponsored or participated in market research to refine your message? ○ Yes ○ No

Market Research Topic

Brand Message

Brand Mission Statement

Community Committees

Do you have a community conservation committee? ○ Yes ○ No

Enter the names of the community committees:

Training

Training Type	# of Trainings	# of Attendees	Description of Other

Social Marketing Expenditures

Public Outreach Social Marketing Expenses

Expense Category	Expense Amount	Description

Partnering Programs - Partners

Name	Type of Program
☐ CLCA?	
☐ Green Building Programs?	
☐ Master Gardeners?	
☐ Cooperative Extension?	
☐ Local Colleges?	
☐ Other	

☐ Retail and wholesale outlet; name(s) and type(s) of programs:

Partnering Programs - Newsletters

Number of newsletters per year

Number of customers per year

Partnering with Other Utilities

Describe other utilities your agency partners with, including electrical utilities

Conservation Gardens

Describe water conservation gardens at your agency or other high traffic areas or new

The La Plaza Garden is a water-efficient demonstration garden featuring drought-tolerant plants, water harvesting techniques, and habitat for birds, butterflies and other beneficial insects.

The Mini Park Lawn Retrofit Program Model Garden is used to promote the City's "Cash for Grass Rebate Program". It was once a 5,000 square foot lawn area and is now a water efficient garden featuring low water use plants and has an added food element with fruit trees and berry bushes.

Landscape contests or awards

Describe water wise landscape contest or awards program conducted by your agency

Comments:

The fields in red are required.

Agency name: City of Cotati

Reporting unit name (District name): City of Cotati

Reporting unit number: 6015

Primary contact:

First name: Damien

Last name: O'Bid

Email: dobid@ci.cotati.ca.us

Click here to open a table that displays your agency name reporting unit name and reporting unit number. Please ensure that you enter the correct information.

Link to FAQs

2010

BMP 2.2 School Education Programs, Retail Agencies

View MOU

School Programs

Is your agency implementing school programs which can be counted to help another agency comply with this BMP? ○ Yes ○ No

Enter Wholesaler Names, separated by commas: Sonoma County Water Agency

☐ Materials meet state education framework requirements?

Description of Materials

☐ Materials distributed to K-6 Students?

Description of materials distributed to K-6 Students

Number of students reached

☐ Materials distributed to 7-12 Students?

Description of materials distributed to 7-12 Students

Number of Distribution

Annual budget for school education program

Description of all other water supplier education programs

School Program Activities

Classroom presentations:

Number of presentations

Number of attendees

Large group assemblies:

Number of presentations

Number of attendees

Children's water festivals or other events:

Number of presentations

Number of attendees

Cooperative efforts with existing science/water education programs (various workshops, science fair awards or judging) and follow-up:

Number of presentations

Number of attendees

Other methods of disseminating information (i.e. themed age-appropriate classroom loaner kits):

Description

Number distributed

Staffing children's booths at events & festivals:

Number of booths | Number of attendees

Water conservation contests such as poster and photo:

Description

Number distributed

Offer monetary awards/funding or scholarships to students:

Number Offered | Total Funding

Teacher training workshops:

Number of presentations | Number of attendees

Fund and/or staff student field trips to treatment facilities, recycling facilities, water conservation gardens, etc.:

Number of tours or field trips | Number of participants

College internships in water conservation offered:

Number of internships | Total funding

Career fairs/workshops:

Number of presentations | Number of attendees

Additional program(s) supported by agency but not mentioned above:

Description

Number of events (if applicable) | Number of participants

Total reporting period budget expenditures for school education programs (include all agency costs):

Comments

The fields in red are required.

Agency name: City of Cotati

Division name (Reporting unit): City of Cotati

Reporting unit number: 6015

Primary contact:

First name: Damien

Last name: O'Bid

Email: dobid@ci.cotati.ca.us

WATER SOURCES

2010

Service Area Population: 7476

Potable Water

Own Supply Source Name	AF/YEAR	Water Supply Type	Water Supply Description
Well 1A	94.00	Groundwater	
Well 2	159.00	Groundwater	
Well 3	42.00	Groundwater	
		Other	
		Other	
		Other	
		Other	
		Other	
		Other	
		Other	
		Other	

Imported Supply Source Name	AF/YEAR	Water Supply Type	Water Supply Description
SCWA	646.00	Groundwater	Sonoma County Water Agency
		Other	
		Other	
		Other	
		Other	
		Other	
		Other	
		Other	
		Other	
		Other	
		Other	

Exported Water Name	AF/YEAR	Where Exported?

The fields in red are required.

Agency name: City of Cotati

Division name (Reporting unit): City of Cotati

Reporting unit number: 6015

Primary contact:

First name: Damien

Last name: O'Bid

Email: dobid@ci.cotati.ca.us

Water Uses

2010

Potable Water Billed

Make sure to enter numbers in AF/Year.

Customer Type	Meter Accounts	Metered Water Delivered	Un-metered Accounts	Un-metered Water Delivered	Description
	2,112.00	450.00	0.00	0.00	
	106.00	116.00	0.00	0.00	
Commercial	167.00	100.00	0.00	0.00	
Dedicated Irrigation	83.00	56.00	0.00	0.00	Commercial
Dedicated Irrigation	58.00	49.00	0.00	0.00	Multi-Family
Other	47.00	32.00	0.00	0.00	City Owned Properties
Other					
Other					
Other					
Other					
Other					
Other					
Other					

Potable Water Un-Billed

Customer Type	Meter Accounts	Metered Water Delivered	Un-metered Accounts	Un-metered Water Delivered	Description
Other					
Other					
Other					
Other					
Other					
Other					
Other					
Other					
Other					
Other					
Other					
Other					

The fields in red are required.

Agency name: City of Cotati

Reporting unit name (District name): City of Cotati

Reporting unit number: 6015

Primary contact:

First name: Damien

Last name: O'Bid

Email: dobid@ci.cotati.ca.us

You must enter the reporting unit number that we have on record for your agency. Click here to open a table to obtain this number.

Link to FAQs

2009

BMP 1.1 Operations Practices

Comments:

See the complete MOU: View MOU

See the coverage requirements for this BMP:

Conservation Coordinator

Conservation Coordinator ◯ Yes ◯ No

Contact Information

First Name	Kevin
Last Name	Fredrickson
Title	Engineering Technician
Phone	7076654238
Email	kfredrickson@ci.cotati.ca.us

Note that the contact information may be the same as the primary contact information at the top of the page. If this is your case, excuse the inconvenience but please enter the information again.

Water Waste Prevention

Water Agency shall do one or more of the following:

a. Enact and enforce an ordinance or establish terms of service that prohibit water waste
b. Enact and enforce an ordinance or establish terms of service for water efficient design in new development
c. Support legislation or regulations that prohibit water waste
d. Enact an ordinance or establish terms of service to facilitate implementation of water shortage response measures
e. Support local ordinances that prohibit water waste
f. Support local ordinances that establish permits requirements for water efficient design in new

To document this BMP, provide the following:

a. A description of, or electronic link to, any ordinances or terms of service
b. A description of, or electronic link to, any ordinances or requirements adopted by local jurisdictions or regulatory agencies with the water agency's service area.
c. A description of any water agency efforts to cooperate with other entities in the adoption or enforcement of local requirement
d. description of agency support positions with respect to adoption of legislation or regulations

You can show your documentation by providing files, links (web addresses), and/or entering a description.

File name(s): Email files to natalie@cuwcc.org

Web address(s) URL: comma-separated list: http://library.municode.com/index.aspx?clientId=16297&stateId=5&stateName=California

Enter a description:: Chapter 13.30 Water Shortage Contingency Plan

The fields in red are required.

Agency name: City of Cotati

Reporting unit name (District name): City of Cotati

Reporting unit number: 6015

Primary contact:

First name: Damien

Last name: O'Bid

Email: dobid@ci.cotati.ca.us

You must enter the reporting unit number that we have on record for your agency. Click here to open a table to obtain this number.

Link to FAQs

View MOU

2009 BMP 1.2 Water Loss Control

Did your agency complete a pre-screening system audit in 2009? Yes (●) No ( )

If yes, answer the following:

Determine metered sales in AF: 862.00

Definition: other accountable uses not included in metered sales, such as unbilled water use, fire suppression, etc.

Determine system verifiable uses AF: 0.00

Determine total supply into the system in AF: 1,012.00

Does your agency keep necessary data on file to verify the answers above? Yes (●) No ( )

Did your agency complete a full-scale system water audit during 2009? Yes (●) No ( )

Does your agency maintain in-house records of audit results or the completed AWWA worksheet for the completed audit which could be forwarded to CUWCC? Yes (●) No ( )

Did your agency operate a system leak detection program? Yes (●) No ( )

Comments:

The fields in red are required.

Agency name: City of Cotati

Reporting unit name (District name): City of Cotati

Reporting unit number: 6015

Primary contact:

First name: Damien

Last name: O'Bid

Email: dobid@ci.cotati.ca.us

You must enter the reporting unit number that we have on record for your agency. Click here to open a table to obtain this number.

BMP 1.3 Metering with Commodity

Link to FAQs

See the complete MOU: View MOU

See the coverage requirements for this BMP:

Implementation

Does your agency have any unmetered service connections? Yes No

If YES, has your agency completed a meter retrofit plan? Yes No

Enter the number of previously unmetered accounts fitted with meters during reporting year:

Are all new service connections being metered? Yes No

Are all new service connections being billed volumetrically? Yes No

Has your agency completed and submitted electronically to the Council a written plan, policy or program to test, repair and replace meters? Yes No

Please Fill Out The Following Matrix

Account Type	# Metered Accounts	# Metered Accounts Read	# Metered Accounts Billed by Volume	Billing Frequency Per Year	# of estimated bills/yr
Single-Family	2,112	2,112	2,112	Bi-monthly	0
Multi-Family	106	106	106	Bi-monthly	0
Commericial	167	167	167	Bi-monthly	0
Dedicated Irrigatic	141	141	141	Bi-monthly	0
Other	47	47	47	Bi-monthly	0
Other				Other	
Other				Other	
Other				Other	
Other				Other	
Other				Other	

Number of CII Accounts with Mixed-use Meters: 84

Number of CII Accounts with Mixed-use Meters Retrofitted with Dedicated Irrigation Meters during Reporting Period: 0

Feasibility Study

Has your agency conducted a feasibility study to assess the merits of a program to provide incentives to switch mixed-use accounts to dedicated landscape meters? Yes No

If YES, please fill in the following information:

A. When was the Feasiblity Study conducted

B. Email or provide a link to the feasibility study (or description of):

File name(s): Email files to natalie@cuwcc.org

Web address(s) URL: comma-separated list

General Comments about BMP 1.3:

The fields in red are required.

Agency name: City of Cotati

Reporting unit name (District name): City of Cotati

Reporting unit number: 6015

Primary contact:

First name: Damien

Last name: O'Bid

Email: dobid@ci.cotati.ca.us

You must enter the reporting unit number that we have on record for your agency. Click here to open a table to obtain this number.

Link to FAQs

View MOU

BMP 1.4 Retail Conservation Pricing

2009

If you are reporting more rate structures than this form allows, add the structures to a spreadsheet and send the file to natalie@cuwcc.org.

Implementation (Water Rate Structure)

Enter the Water Rate Structures that are assigned to the majority of your customers, by customer class

Rate Structure	Customer Class	Total Revenue Commodity Charges	Total Revenue Customer Meter/Service (Fixed Charges)
Uniform	Single-Family	409,298.00	362,382.00
Uniform	Multi-Family	99,528.00	47,871.00
Uniform	Commercial	86,028.00	54,386.00
Uniform	Dedicated Irrigation	90,444.00	46,805.00
Uniform	Other	27,478.00	23,055.00
Select a Rate Struc	Other		
Select a Rate Struc	Other		

Implementation Option (Conservation Pricing Option)

- ○ Use Annual Revenue As Reported
- ○ Use Canadian Water & Wastewater Association Rate Design Model

If CWWA is select, enter the file name and email the spreadsheet to natalie@cuwcc.org

Retail Waste Water (Sewer) Rate Structure by Customer Class

Agency Provide Sewer Service ○ Yes ○ No

Select the Retail Waste Water(Sewer) Rate Structure assigned to the majority of your customers within a specific customer class.

Rate Structure	Customer Class	Total Revenue Commodity Charges	Total Revenue Customer Meter/Service (Fixed Charges)
Uniform	Single-Family	929,903.00	829,027.00
Uniform	Commercial	177,124.00	123,877.00
Select a Rate Struc	Other		
Select a Rate Struc	Other		
Select a Rate Struc	Other		
Select a Rate Struc	Other		
Select a Rate Struc	Other		

Comments:

The fields in red are required.

Agency name: City of Cotati

Reporting unit name (District name): City of Cotati

Reporting unit number: 6015

Primary contact:

First name: Damien

Last name: O'Bid

Email: dobid@ci.cotati.ca.us

Click here to open a table that displays your agency name reporting unit name and reporting unit number. Please ensure that you enter the correct information.

Link to FAQs

2009

BMP 2.1 Public Outreach - Retail Reporting

View MOU

Is a Wholesale Agency Performing Public Outreach?

Are there one or more wholesale agencies performing public outreach which can be counted to help your agency comply with the BMP? ○ Yes ○ No

Enter the name(s) of the wholesale agency (comma delimited): Sonoma County Water Agency

Is your agency performing public outreach?

Report a minimum of 4 water conservation related contacts your agency had with the public during the year.

Public Information Programs List

Did at least one contact take place during each quarter of the reporting year? ☐

Number of Public Contacts		Public Information Programs	
	Newsletter articles on conservation		
	Newsletter articles on conservation		
	General water conservation information		
	Website		
	Select a public contact		

Contact with the Media

Are there one or more wholesale agencies performing media outreach which can be counted to help your agency comply with the BMP? ○ Yes ○ No

Enter the name(s) of the wholesale agency (comma delimited):

OR Retail Agency (Contacts with the Media)

Media Contacts List

Did at least one contact take place during each quarter of the reporting year? ☐

Number of Media Contacts	Did at least one contact take place during each quarter of the reporting year?	Media Contact Types	
	Radio contacts		
	Newspaper contacts		
	Select a type of media contact		
	Select a type of media contact		
	Select a type of media contact		
	Select a type of media contact		

Is a Wholesale Agency Performing Website Updates?

Did one or more CUWCC wholesale agencies agree to assume your agency's responsibility for meeting the requirements of and for CUWCC reporting of this BMP? ○ Yes ○ No

Enter the name(s) of the wholesale agency (comma delimited)

Is Your Agency Performing Website Updates?

Enter your agency's URL (website address): www.ci.cotati.ca.us

Describe a minimum of four water conservation related updates to your agency's website that took place during the year:

Did at least one Website Update take place during each quarter of the reporting year? ○ Yes ○ No

Public Outreach Annual Budget

Enter budget for public outreach programs. You may enter total budget in a single line or brake the budget into discrete categories by entering many rows. Please indicate if personnel costs are included in the entry.

Category	Amount		Personnel Costs Included? If yes, check the box.	Comments	

Comments:

The fields in red are required.

Agency name: City of Cotati

Reporting unit name (District name): City of Cotati

Reporting unit number: 6015

Primary contact:

First name: Damien

Last name: O'Bid

Email: dobid@ci.cotati.ca.us

Click here to open a table that displays your agency name reporting unit name and reporting unit number. Please ensure that you enter the correct information.

Link to FAQs

2009

BMP 2.1 Public Outreach Cont'd

View MOU

Public Outreach Expenses

Enter expenses for public outreach programs. Please include the same kind of expenses you included in the question related to your budget (Section 2.1.7, above). For example, if you included personnel costs in the budget entered above, be sure to include them here as well.

Expense Category	Expense Amount	Personnel Costs Included?	
			If yes, check the check box.

Additional Public Information Program

Please report additional public information contacts. List these additional contacts in order of how your agency views their importance / effectiveness with respect to conserving water, with the most important/ effective listed first (where 1 = most important).

Were there additional Public Outreach efforts? ○ Yes ○ No

Public Outreach Additional Information

Public Information Programs	Importance	
Newsletter articles on conservation		
Newsletter articles on conservation		
General water conservation information		

Social Marketing Programs

Branding

Does your agency have a water conservation "brand," "theme" or mascot? ○ Yes ○ No

Describe the brand, theme or mascot.

Market Research

Have you sponsored or participated in market research to refine your message? ○ Yes ○ No

Market Research Topic

Brand Message

Brand Mission Statement

Community Committees

Do you have a community conservation committee? ○ Yes ○ No

Enter the names of the community committees:

Training

Training Type	# of Trainings	# of Attendees	Description of Other

Social Marketing Expenditures

Public Outreach Social Marketing Expenses

Expense Category	Expense Amount	Description

Partnering Programs - Partners

Name	Type of Program
☐ CLCA?	
☐ Green Building Programs?	
☐ Master Gardeners?	
☐ Cooperative Extension?	
☐ Local Colleges?	
☐ Other	

☐ Retail and wholesale outlet; name(s) and type(s) of programs:

Partnering Programs - Newsletters

Number of newsletters per year

Number of customers per year

Partnering with Other Utilities

Describe other utilities your agency partners with, including electrical utilities

Conservation Gardens

Describe water conservation gardens at your agency or other high traffic areas or new

The La Plaza Garden is a water-efficient demonstration garden featuring drought-tolerant plants, water harvesting techniques, and habitat for birds, butterflies and other beneficial insects.

The Mini Park Lawn Retrofit Program Model Garden is used to promote the City's "Cash for Grass Rebate Program". It was once a 5,000 square foot lawn area and is now a water efficient garden featuring low water use plants and has an added food element with fruit trees and berry bushes.

Landscape contests or awards

Describe water wise landscape contest or awards program conducted by your agency

Comments:

The fields in red are required.

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Reporting unit name (District name): City of Cotati

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Primary contact:

First name: Damien

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Click here to open a table that displays your agency name reporting unit name and reporting unit number. Please ensure that you enter the correct information.

Link to FAQs

2009

BMP 2.2 School Education Programs, Retail Agencies

View MOU

School Programs

Is your agency implementing school programs which can be counted to help another agency comply with this BMP? ○ Yes ○ No

Enter Wholesaler Names, separated by commas: Sonoma County Water Agency

☐ Materials meet state education framework requirements?

Description of Materials

☐ Materials distributed to K-6 Students?

Description of materials distributed to K-6 Students

Number of students reached

☐ Materials distributed to 7-12 Students?

Description of materials distributed to 7-12 Students

Number of Distribution

Annual budget for school education program

Description of all other water supplier education programs

School Program Activities

Classroom presentations:

Number of presentations

Number of attendees

Large group assemblies:

Number of presentations

Number of attendees

Children's water festivals or other events:

Number of presentations

Number of attendees

Cooperative efforts with existing science/water education programs (various workshops, science fair awards or judging) and follow-up:

Number of presentations

Number of attendees

Other methods of disseminating information (i.e. themed age-appropriate classroom loaner kits):

Description

Number distributed

Staffing children's booths at events & festivals:

Number of booths | Number of attendees

Water conservation contests such as poster and photo:

Description

Number distributed

Offer monetary awards/funding or scholarships to students:

Number Offered | Total Funding

Teacher training workshops:

Number of presentations | Number of attendees

Fund and/or staff student field trips to treatment facilities, recycling facilities, water conservation gardens, etc.:

Number of tours or field trips | Number of participants

College internships in water conservation offered:

Number of internships | Total funding

Career fairs/workshops:

Number of presentations | Number of attendees

Additional program(s) supported by agency but not mentioned above:

Description

Number of events (if applicable) | Number of participants

Total reporting period budget expenditures for school education programs (include all agency costs):

Comments

The fields in red are required.

Agency name: City of Cotati

Division name (Reporting unit): City of Cotati

Reporting unit number: 6015

Primary contact:

First name: Damien

Last name: O'Bid

Email: dobid@ci.cotati.ca.us

WATER SOURCES

2009

Service Area Population: 7476

Potable Water

Own Supply Source Name	AF/YEAR	Water Supply Type	Water Supply Description
Well 1A	94.00	Groundwater	
Well 2	159.00	Groundwater	
Well 3	42.00	Groundwater	
		Other	
		Other	
		Other	
		Other	
		Other	
		Other	
		Other	
		Other	

Imported Supply Source Name	AF/YEAR	Water Supply Type	Water Supply Description
SCWA	646.00	Groundwater	Sonoma County Water Agency
		Other	
		Other	
		Other	
		Other	
		Other	
		Other	
		Other	
		Other	
		Other	
		Other	

Exported Water Name	AF/YEAR	Where Exported?

The fields in red are required.

Agency name: City of Cotati

Division name (Reporting unit): City of Cotati

Reporting unit number: 6015

Primary contact:

First name: Damien

Last name: O'Bid

Email: dobid@ci.cotati.ca.us

Water Uses

2009

Potable Water Billed

Make sure to enter numbers in AF/Year.

Customer Type	Meter Accounts	Metered Water Delivered	Un-metered Accounts	Un-metered Water Delivered	Description
	2,112.00	450.00	0.00	0.00	
	106.00	116.00	0.00	0.00	
Commercial	167.00	100.00	0.00	0.00	
Dedicated Irrigation	83.00	56.00	0.00	0.00	Commercial
Dedicated Irrigation	58.00	49.00	0.00	0.00	Multi-Family
Other	47.00	32.00	0.00	0.00	City Owned Properties
Other					
Other					
Other					
Other					
Other					
Other					
Other					

Potable Water Un-Billed

Customer Type	Meter Accounts	Metered Water Delivered	Un-metered Accounts	Un-metered Water Delivered	Description
Other					
Other					
Other					
Other					
Other					
Other					
Other					
Other					
Other					
Other					
Other					
Other					
Other					

The fields in red are required.

Agency name: City of Cotati

Reporting unit name (District name): City of Cotati

Reporting unit number: 6015

Primary contact:

First name: Damien

Last name: O'Bid

Email: dobid@ci.cotati.ca.us

You must enter the reporting unit number that we have on record for your agency. Click here to open a table to obtain this number.

Base Year Data

Link to FAQs

Reporting Unit Base Year

What is your reporting period? Calendar

Base Year 2008

BMP 1.3 Metering

Number of unmetered accounts in Base Year 0

BMP 3.1 & BMP 3.2 & BMP 3.3 Residential Programs

Number of Single Family Customers in Base Year 2,109

Number of Multi Family Units in Base Year 106

BMP 3.4 WaterSense Specification (WSS) Toilets

Number of Single Family Housing Units constructed prior to 1992 1777

Number of Multi Family Units prior to 1992 613

Average number of toilets per single family household 2.4

Average number of toilets per multi family household 1.5

Five year average resale rate of single family households 9.7%

Five-year average resale rate of multi family households 10.0%

Average number of persons per single family household 2.55

Average number of persons per multi family household 2.55

BMP 4.0 & BMP 5.0 CII & Landscape

Total water use (in Acre Feet) by CII accounts 198

Number of accounts with dedicated irrigation meters 82

Number of CII accounts without meters or with Mixed Use Meters 85

Number of CII accounts 167

Comments:

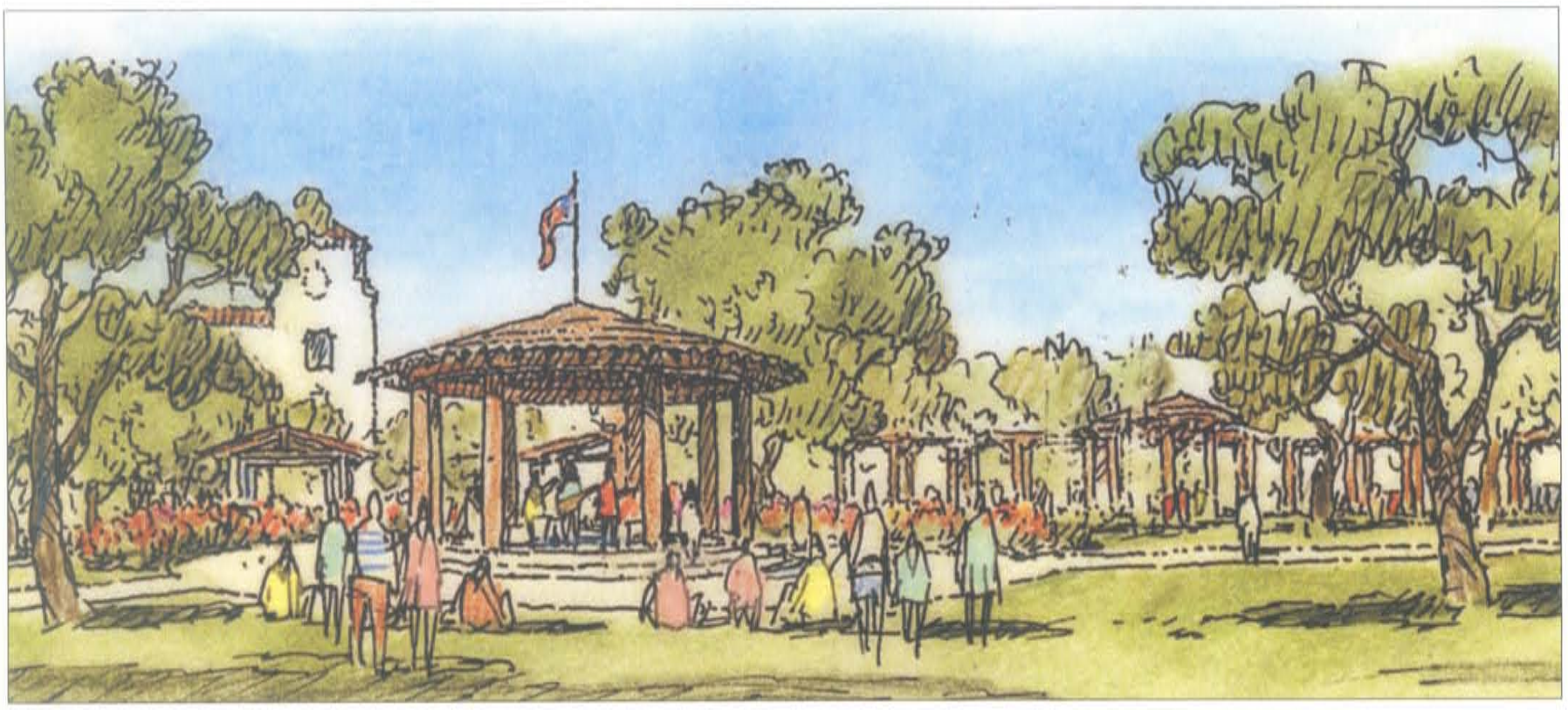
version 1.0

APPENDIX G – DOWNTOWN SPECIFIC PLAN

CITY OF COTATI

DOWNTOWN SPECIFIC PLAN

Adopted August 26, 2009



Top: La Plaza Park
Bottom Left: Northern Gateway around the Village Square
Bottom Right: New Development Around La Plaza

DOWNTOWN COTATI SPECIFIC PLAN

CITY OF COTATI 201 W. Sierra Avenue
Cotati, CA 94931
707-665-3637

CITY COUNCIL
John Guardino, Mayor
Robert Coleman-Senghor, Vice Mayor
George Barich, Councilmember
Pat Gilardi, Councilmember
Janet Orchard, Councilmember

CITY STAFF
Dianne Thompson, City Manager
Marsha Sue Lustig, Assistant to the City Manager/
Acting Community Development Director
Misti Harris, Assistant Planner
Damien O'Bid, City Engineer
Jone Hayes, Director of Administrative Services

PLANNING COMMISSION
Linell Hardy, Chair
Jerry Pagnusat, Vice Chair
Neil Hancock, Commissioner
Susan Harvey, Commissioner
Tim Ritter, Commissioner

DESIGN REVIEW COMMITTEE
Greg LeDoux, Chair
Richard Merriss, Vice Chair
Sally Glendening, Member
Bruce Hammond, Member

Adopted on August 26, 2009:
City Council Resolution Numbers 2009-65 and 2009-66
Cotati Community Redevelopment Agency Resolution Numbers CRA 219 and CRA 220

Adopted on September 9, 2009:
City Council Ordinance Number 823

CONSULTANT TEAM

URBAN DESIGN AND ARCHITECTURE
Moule & Polyzoides Architects and Urbanists
180 East California Boulevard
Pasadena, California 91105
Stefanos Polyzoides spolyzoides@mparchitects.com
Alan Loomis
Anthony Perez
Orlando Gonzalez
Xiao Jian He
Jason Claypool

Bill Dennis, Architect
Juan Pablo Rosales, Architect
Blair Prentice, Architect

CODES / EIR
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Charlie Knox knox@cmcaplans.com

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Catherine Thieme

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Birmingham, MI 48009
Robert Gibbs GibbsReport@aol.com

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58 Alta Vista Avenue
Mill Valley, CA 94941
David Parisi david@parisi-associates.com

Swift and Associates, LLC
1699 Geneva Circle
Longmont, CO 80501
Peter Swift phswi@aol.com

LIST OF EXHIBITS

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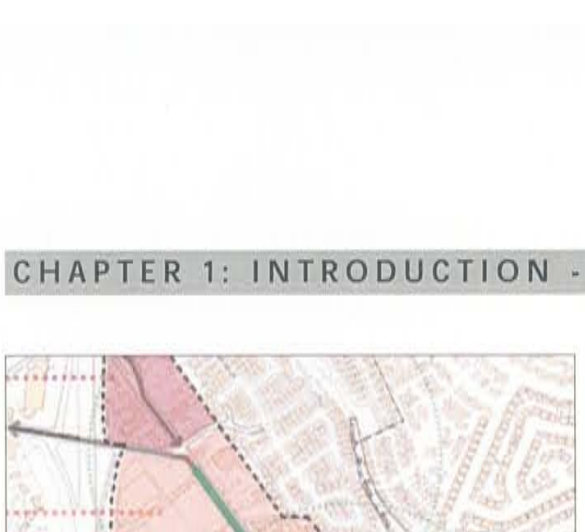
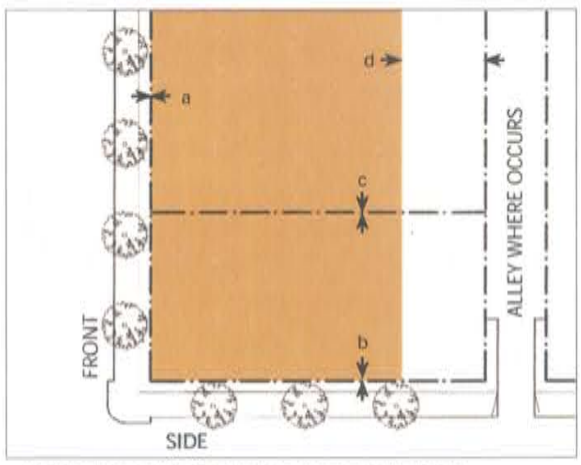


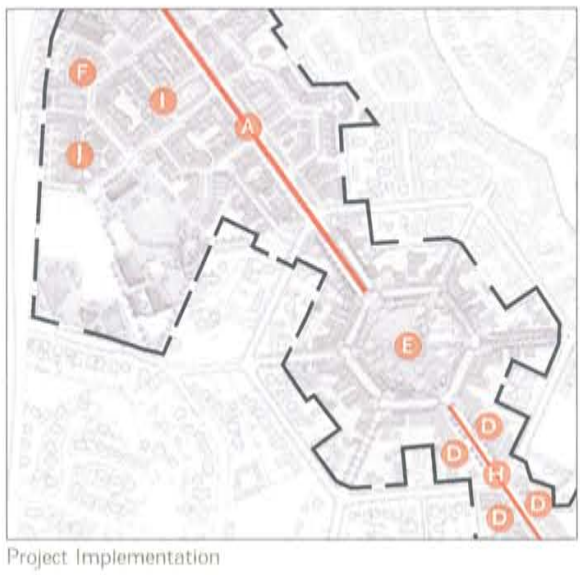
Public and Private Realms:
Circulation Network, Blocks and Streets

CHAPTER 3: IMPLEMENTATION - STANDARDS AND GUIDELINES 3



Regulations and Guidelines to supprort the vision

CHAPTER 4: INFRASTRUCTURE FINANCING PLAN 4



Project Implementation

CHAPTER 1 : INTRODUCTION

1.1 - Plan Purpose

Why prepare a Specific Plan?

Cities are dynamic and ever-changing places that experience many cycles of growth and change over time. Cities with distinguished histories and contexts such as Cotati, often find themselves needing to guide this change so that existing strengths can be reinforced, enabling appropriate change to be realized. One of the tools that cities use to guide such change is a Specific Plan. A Specific Plan is intended to provide a coherent road map for a geographically defined area. This road map further implements the General Plan for the area by providing tailored goals, strategies and tools with which to achieve the intended outcomes.

The purpose of this Specific Plan is twofold:

Vision - The first is to translate the community vision for the Specific Plan area into goals, policies, regulations and standards that guide daily decisions for the plan area over its 20-year planning horizon.

Goals - The second and related purpose of this plan is to enable revitalization of the plan area based on the needs, opportunities and constraints identified through the planning process.

1.2 - Plan Authority

This Specific Plan is enacted pursuant to Government Code Section 65450 et seq., to apply to all property within the plan boundaries. This plan and its contents work in concert with the Cotati Municipal Code.

1.3 - Relationship of this Specific Plan to the General Plan

California Government Code Section 65451(b) requires that each specific plan ". . . include a statement of the relationship of the specific plan to the general plan." This section describes the most important aspects of the relationship between this Specific Plan and the Cotati General Plan.

The Downtown Specific Plan implements a variety of goals and policies in the Cotati General Plan by providing a renewed vision, and standards for the continuing enhancement of the Downtown, and adjacent areas extending north to Gravenstein Highway. Of course, no specific plan can implement every policy in a General Plan because General Plan policies cover many aspects of community life and its future that a specific p an would not appropriately address. Therefore, the key General Plan policies that are implemented by this Specific Plan are in the Land Use and Urban Design Elements of the General Plan. A discussion of the relevant General Plan goals and policies in relation to the provisions of this Specific Plan is provided as applicable.

KEY GENERAL PLAN POLICIES

The following General Plan policies are particularly relevant to the plan area and therefore inform this Specific Plan.

Community Development

Policy 2.2.1
Establish and maintain continuous clearly identifiable bicycle routes and facilities on Old Redwood Highway, East Cotati Avenue, Gravenstein Highway, and West Sierra Avenue.

Policy 2.2.2
Maintain and develop a network of walkways and sidewalks along arterial and collector streets to provide for safe and efficient travel.

Policy 2.2.9
Enhance the safety of pedestrian crossings in the Hub area while ensuring a delightful downtown experience.

Policy 2.3.3
Encourage the use of multi-purpose parking lots that serve both multi-family residential and commercial uses.

Quality of Life

Policy IP 2.2.2
Increase the amount of developable, high density residential land.

Policy 11.1.1.b
Mixed uses shall be encouraged in the Hub area.

Policy 11.1.4
Provide safe walking areas for pedestrians, allow safe on-street parking and provide adequate street width for fire safety vehicles in the Hub.

Policy 11.2
Ensure that adequate parking in the Hub area is available.

Policy 11.3
Establish a downtown character which preserves the historic "Old Town" feeling of the Hub and promotes new development which is compatible in scale with existing structures.

Policy 11.3.5
Preserve existing structures with designated historic value.

Community Identity

Policy 14.
Maintain the hub as the principal social and cultural center of the community.

1.4 - SPECIFIC PLAN GOALS

The following goals embody the overall direction of and inform this Specific Plan. Each goal is intended to generate objectives and policies that individually work toward the ultimate intention to revitalize the Specific Plan area.

- **GOAL 1:** **Enhance Old Redwood Highway as the downtown, mixed-use center of Cotati community life.**

- **GOAL 2:** **Maintain the historic character which makes Cotati unique, and achieve a high level of design quality to reinforce this character.**

- **GOAL 3:** **Improve the walking and bicycling system through downtown Cotati as well as the interconnections between Cotati and the region.**

- **GOAL 4:** **Promote a street system that is safe for all modes of transportation within a successful commercial mixed-use environment.**

- **GOAL 5:** **Design housing to accomodate a diversity of income levels, ages and needs.**

- **GOAL 6:** **Encourage development that is sustainable: energy efficient and conserves resources.**

Aerial of Downtown Cotati with approximate 5-minute, 1/4 mile walkable radius from La Plaza Park

Specific Plan Boundary

SP Map 1

0 400 800 1200 ft

Key

Specific Plan Boundary

City Limits between Cotati and Rhonert Park

1.5 - Existing Conditions

1.5.010 - Project Location and Boundaries

This Specific Plan involves 59.5 acres [a] generally bounded by US 101, north city limits, Arthur and Page Streets. The plan-boundary includes the areas commonly referred to as 'downtown', La Plaza Park and Old Redwood Highway.

1.5.020 - Constraints and Opportunities

Through the public participation and planning process, the following were identified as the salient constraints and opportunities influencing the plan:

Constraints

- Several community-wide and regional connectors traverse the plan area
- La Plaza Park serves as a community focus but is significantly bisected by wide thoroughfares that dilute its potential
- Lack of open space beyond La Plaza Park
- Discontinuous bicycle and pedestrian circulation
- Adaptive re-use of historic buildings not currently regulated
- Other, competing commercial attractions reduce the area's spending power
- Redevelopment Agency has limited funding

Opportunities

- Historic La Plaza Park Hexagon in tact along its edges
- Immediate proximity to US 101 (100,000 average daily vehicles)
- Laguna de Santa Rosa and a class 1 bike path traverse the eastern edge of the planning area
- Large amount of mature trees
- Substantially intact urban fabric and character
- Existing historic buildings
- Golden Gate Transit plans to expand bus service in the planning area
- Substantial weekend population through tourism
- Substantial amount of available spending power in area
- Relatively large vacant and underutlized land in northern planning area

[a] The net developable area exclusive of rights-of-way is 54 acres from an overal 59.5 acres identified in chapter 4 'Development Potential'.

1.5.030 - Regional Conditions

Existing Conditions - Cotati is a small historic town located 40 miles north of San Francisco, in the southern region of Sonoma's wine country. Cotati has a population of 7,800 and was established in 1892 by the Page brothers acting as The Cotati Company on an 1877 Spanish land grant. The city became incorporated in 1963. Sonoma County has nine incorporated towns and cities with a population of about 500,000, which is projected to increase to 540,000 by 2015 at an average annual rate of 1.5%. Over the past decade, Windsor and Santa Rosa have grown at a higher pace of 2.9% and 2.1% respectively.

The majority of the area's jobs are in nearby Santa Rosa, Petaluma and at Sonoma State University producing a commuter-type of pattern in Cotati and the surrounding area. Downtown Cotati is one of several historic downtowns within a 20-mile radius putting it in direct competition with better known and more developed downtowns such as those in Sonoma, Healdsburg and Petaluma.

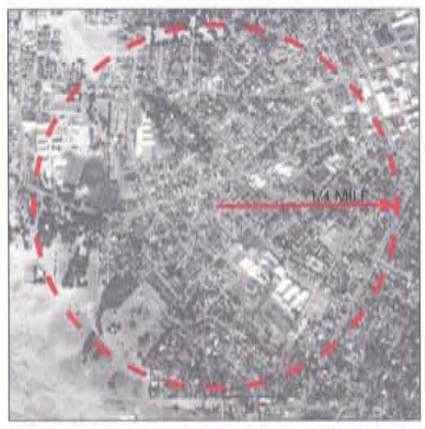
Sonoma County as a region covers 1604 square miles, including Pacific Ocean beaches and wine country hillsides. The county enjoys a strong international tourism industry that generated over $1.02 billion in visitor spending in 2003. Median household incomes in the region rose in the past decade, with Petaluma at the top of the range at $61,679, and Cotati above neighboring Rohnert Park at at $52,808, but slightly below the county average of $53,076.

Housing
Cotati houses 2% of Sonoma County's population which is projected to grow to 558,000 by 2030. In 2005, the County's median home value was about $550,000 with Cotati's in the area of $425,000. Cotati is projected to grow slightly faster than the county over the next 20 years, although a limited land supply within its Urban Growth Boundary will slow the City's growth in the long term. Sonoma county will add 80,000 new residents over the next 25 years, with growth primarily in Santa Rosa and Petaluma.

Transit and Transportation
The 101 Freeway carries over 100,000 average daily vehicles through the region along its frontage with Cotati. The freeway bisects Sonoma County in a north-south direction providing access to the west half along the Pacific Ocean and the eastern half toward the Napa Valley. Originally, the main north-south route was along the alignment of what is now Old Redwood Highway until 1955, when the State established the 101 Freeway to the west. Gravenstein Highway is a State Route (116) providing east-west access between Cotati and western Sonoma County. East Cotati Avenue provides access to Sonoma State University to the east.

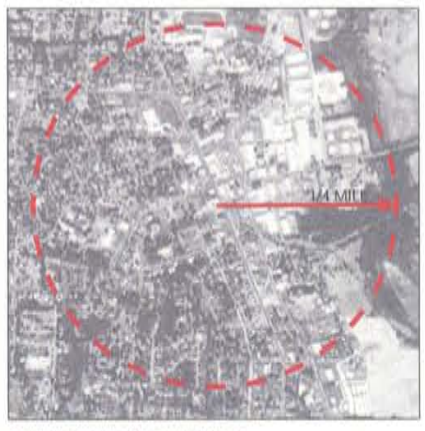
While 30% of the county's employed residents work in the place they live, this is true for only 10% of Cotati's employed residents. Sonoma County Transit operates four routes through the city: 10, 11, 26 and 48. These routes operate in Cotati between 6am and 8pm, with weekend service only on Route 48. Ridership has increased since 1999 on Route 10, where almost 60 percent of riders in 2004 were students, and almost one-third of Route 26 riders were disabled. Golden Gate Transit also serves Cotati with daily bus service between Santa Rosa and San Francisco. Daily, about 125 Cotati passengers took weekday round-trips in 2005. Covered bus shelters are provided at several stops along Old Redwood Highway, East Cotati Avenue, and West Sierra Avenue. Carpoolers utilize Caltrans park-and-ride lots southeast and southwest of the Highway 101 and Gravenstein Highway interchange.

Cotati in the context of Sonoma County



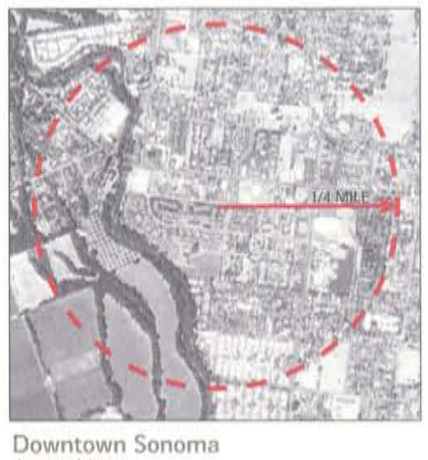
Downtown Petaluma
Aerial View


Traditional architecture and materials

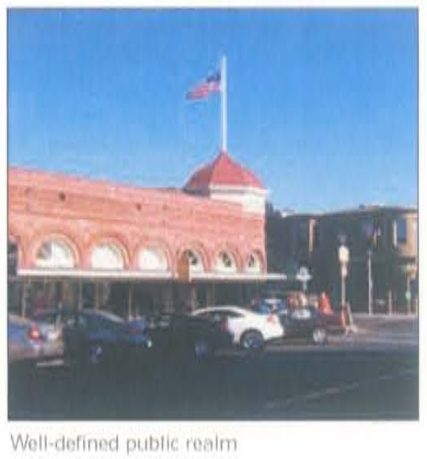


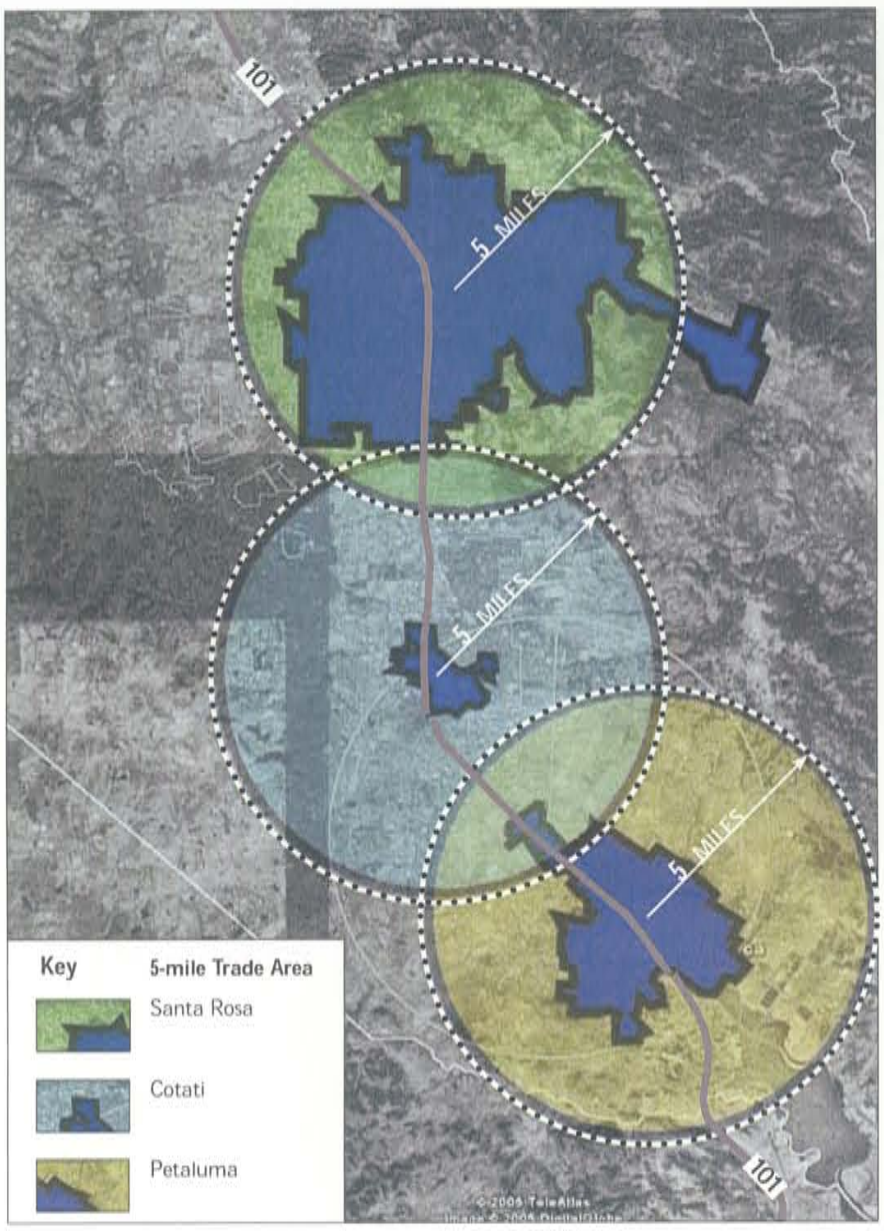
Downtown Sebastopol
Aerial View

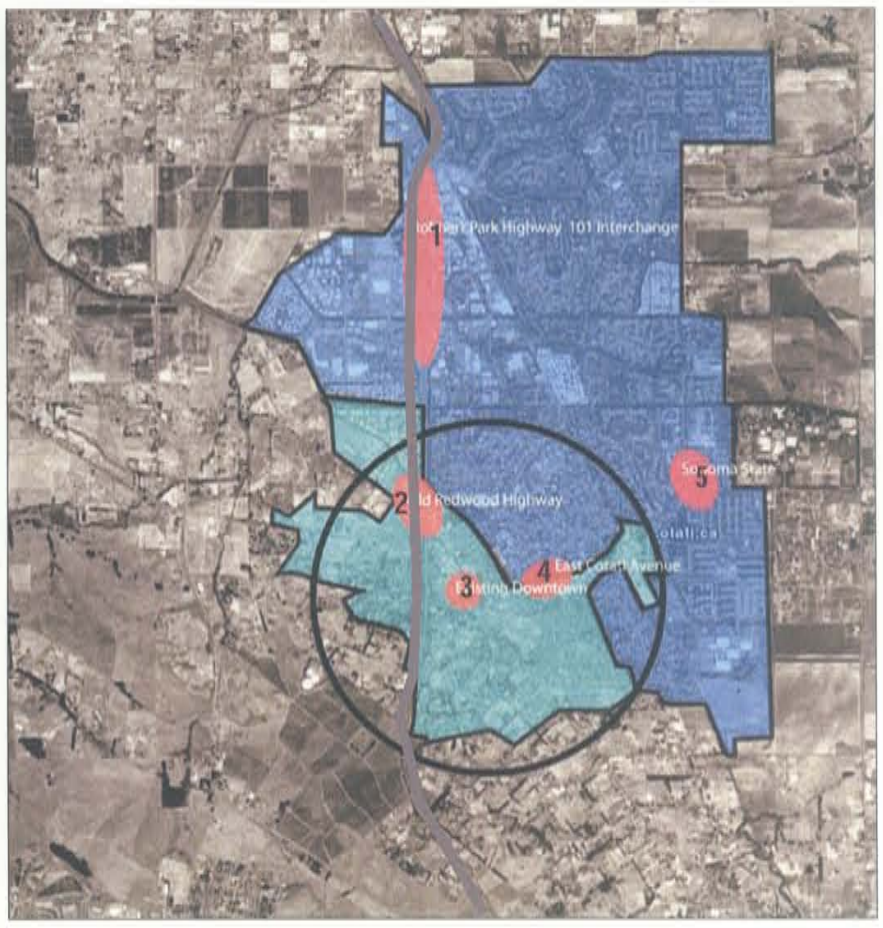

Distinctive community building



Downtown Sonoma
Aerial View


Well-defined public realm





Key	Existing Business Nodes
1	Rohnert Park/ Highway 101 Interchange
2	Old Redwood Highway / Gravenstein Highway / Highway 101
3	Existing Downtown (Historic Core)
4	East Cotati Avenue
5	Sonoma State University

1.5.040 - Local Economic Conditions

Strategic Economics completed an analysis of the short and long term market potential for commercial uses in the Downtown plan area. The Downtown was evaluated in terms of two primary trade areas: a) the more immediate neighborhood area consisting of the cities of Cotati and Rohnert Park, from which local purchases are made; and b) the larger regional area consisting of a five mile radius from the site, from which more occasional purchases are made.

Regional Trade Area - The rural nature of Cotati's 5-mile regional trade area limits the possibility for regional retail, particularly when compared with Santa Rosa's regional trade area with five times Cotati's regional population, and Petaluma's trade area with average incomes that are $20,000 higher than Cotati's.

Neighborhood Trade Area - As most of the area's neighborhood retail is concentrated at the intersection of Highway 101 and Gravenstein Highway, the neighborhood trade area includes both Rohnert Park and Cotati. This area includes approximately 18,600 households. These households tend to be younger than average for the County, and have a smaller share of college degrees. Household incomes are similar to the County median of $53,000.

Housing
Cotati's population of 7,800 is housed in 2,545 dwellings of which 1,497 are single-family detached houses and the other 1,048 are in a variety of multi-family type of buildings. Approximately 78% of this housing stock is less than 35 years of age.

Retail
Residents of Cotati and Rohnert Park are relatively young with modest but increasing incomes. In the last five years, both cities have captured new homes in the strong housing market, which is having the effect of accelerating general growth in the area and shifting average income and age characteristics upwards.

Discount retail tenants have been drawn to Rohnert Park because of the area's more modest incomes relative to Santa Rosa and Petaluma, creating one of the few discount retail destinations in the County. Its recent household growth and slow history of retail development enable Cotati to distinguish both neighborhood and regional retail from the discount-oriented and big box retail identity of Rohnert Park, and to fill an unmet niche for smaller, independent, and boutique retail tenants.

Currently, the unmet demand for retail space in Cotati and Rohnert Park is a relatively small increment at 50,000 square feet. However, projected household growth over the next 20 years could more than quadruple the unmet demand for space.

Office
There is a strong presence of small and home-based businesses in Cotati that may offer some additional long-term demand for office space in the Downtown. New office space should accommodate the special needs of smaller businesses by offering smaller suite sizes, simple fee rents, or ownership options, or live-work options.

Given regional weaknesses in the office market over the last five years, the introduction of office space in Downtown Cotati may occur in a longer term than residential or retail development. Mixed-use buildings will be a more desirable option for providing office space in the shorter term, particularly by reducing the overall risk in providing office space in a relatively untapped market.

Implications for the Downtown Specific Plan
The market analysis shows that Cotati is well positioned to play to its strengths in attracting further retail investment to its Downtown.

These strengths include Cotati's identity as a unique and small town community;

The presence of the existing Historic Core as the only pedestrian-oriented retail area in Cotati and Rohnert Park;

The plan area's proximity to Highway 101, and alignment on Old Redwood Highway; and

Community and developer interest in building a quality retail-oriented downtown that targets local and regional tenants.

The strategy for repositioning Downtown Cotati will take advantage of the ongoing market for residential growth, be flexible with the market and phase in retail and office space more slowly over time, and develop and enhance Cotati's unique identity in order to ultimately create a regional destination with a wide variety of tenant types. In the short and mid-term, Downtown Cotati will serve its own residential base, meeting neighborhood and subregional retail needs including Sonoma State University.

1.5.050 - Local Physical Conditions

Downtown Cotati is characterized by 1 to 2-story buildings in a village-scale environment organized around Old Redwood Highway and La Plaza Park which date from 1892. The 59.5-acre planning area contains enough area for two pedestrian sheds: an area that is measured by an approximate 5-minute walk from center to edge or a 10-minute walk across. The plan area consists of the following places and characterstics:

Commerce Avenue: Being adjacent to and visible from US 101, automobile-oriented services and retail predominate in primarily 1-story buildings that are set back from the street with off-street parking. The landscape is suburban in character with a discontinuos streetscape.

North Old Redwood Highway: This area is the one most in transition with older buildings interspersed among more recent suburban type of 1-story strip development and major areas of vacant and underutilized land. Regional distribution lines for PG&E are located along the east edge of Old Redwood Highway. The landscape is discontinous, ranging from suburban to rural with many mature trees scattered throughout the area.

La Plaza Park: The historic hexagon visibly anchors the community and through weekly and seasonal events in the park. However, the park is bisected by Old Redwood Highway, West Sierra Avenue and East Cotati Avenue, resulting in four small areas circumscribed by high capacity roads that carry regional and community traffic. Development around the park is primarily historic, 1-story buildings with some 2-story buildings near downtown. This public park is the site of the seasonal farmer's market and has a bandstand that is used for several events such as the annual Accordion Festival and other events throughout the year. This public space which was initially built as a hexagonal park in response to the town plan of 1892, is currently bisected by regional traffic in two directions: north-south by Old Redwood Highway and east-west by West Sierra Avenue/East Cotati Avenue.

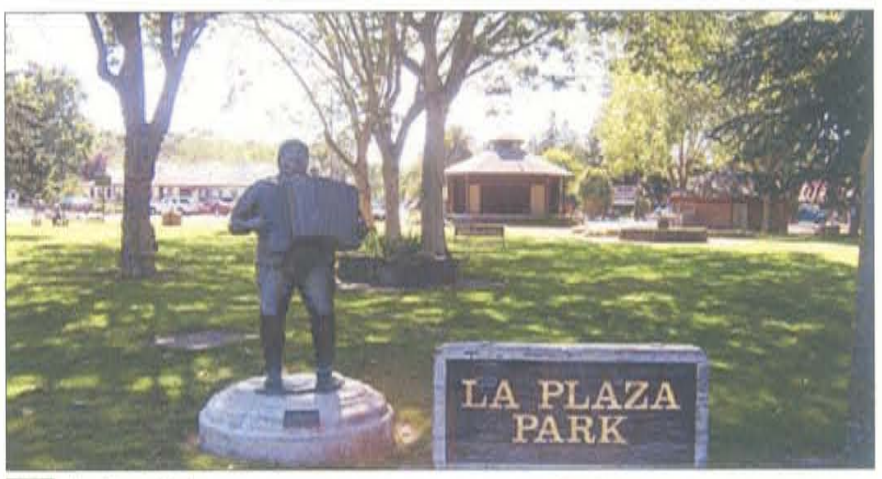
Downtown: The historic core is positioned on Old Redwood Highway and continues the tradition of businesses fronting on this 90-year old thoroughfare. North of the historic core is La Plaza Park.

Downtown has a variety of buildings ranging from the simple, false front commercial buildings to 1-story commercial shop front buildings and 2-story office/housing over commercial buildings. Interspersed among these are various fine examples of residential and commercial buildings dating from as far back as the early 1900's.

Downtown's landscape is characterized by informal plantings of oaks, sycamores, and several types of conifers. Cotati's rustic and agricultural roots are still very present and visible throughout Downtown and the adjacent neighborhoods.

Commerce Avenue 'north city limits' — Automobile-oriented development

Old Redwood Highway 'north' — Old Redwood Highway (north of La Plaza)



La Plaza Park — The Park is a community-wide amenity

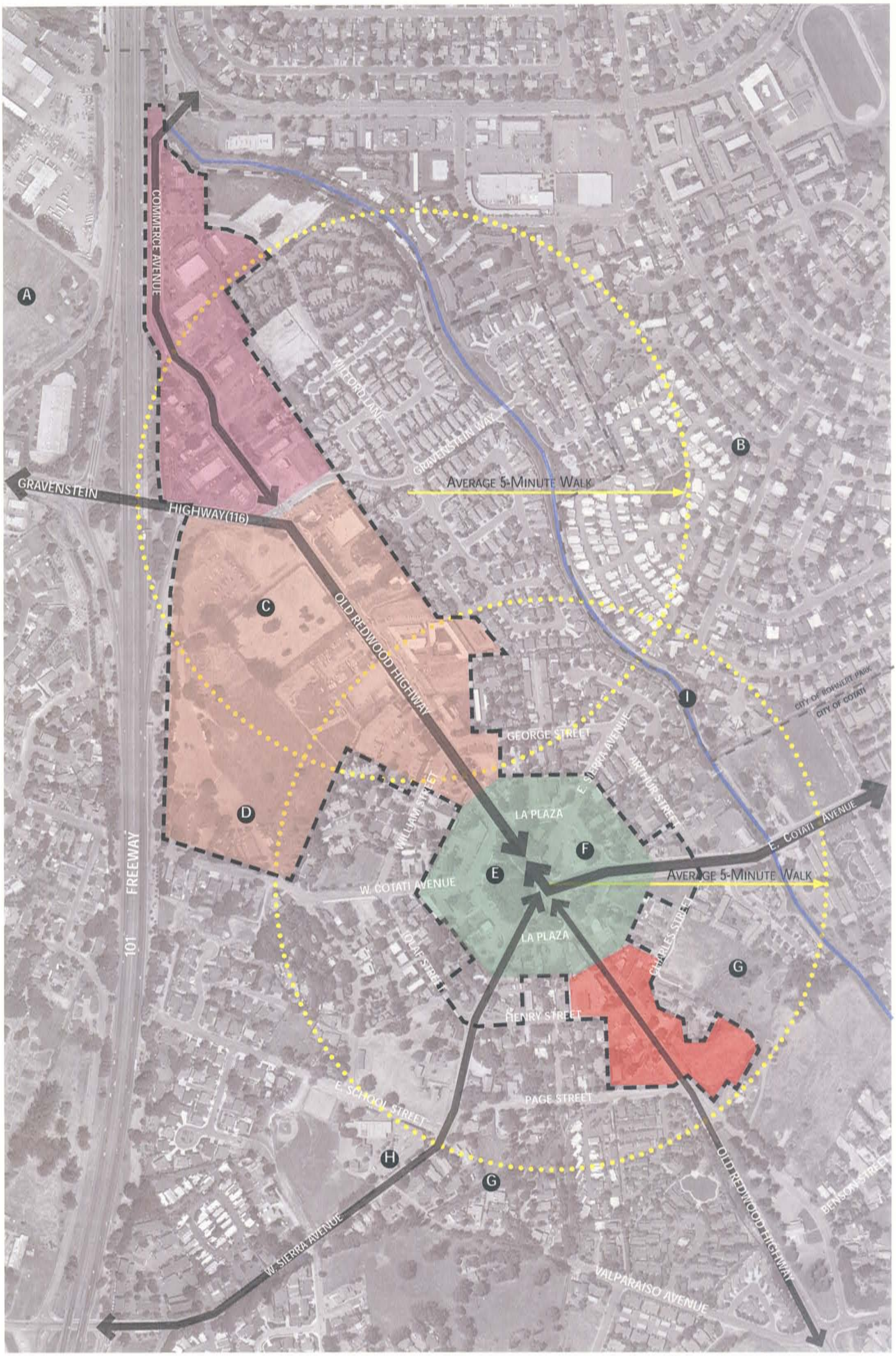
Historic Downtown — Historic buildings fronting Old Redwood Highway south of La Plaza Park

Right and Above:
Each of the four places in the planning area is generally identified within the boundaries of the planning area.

Key

- Specific Plan Boundary
- City Limits between Cotati and Rhonert Park
- Laguna de Santa Rosa
- Pedestrian Shed: Avg 5-minute walk radius
  Note: these sheds are for mainly evaluting proximity and access within a comfortable 5-minute walk. The southerly shed is centered on La Plaza Park as this encompases both the park and the historic core. The northerly shed addresses the expansion area to the north and is defined on the west by the US 101 freeway which except at Gravenstien Highway, prevents pedestrian, bicycle or automobile access. For this primary reason, the walking radius is centered further east.
- Community-wide circulation Pattern

- (A) South Sonoma Business Park anchored by Lowes (160,000 total square feet)
- (B) Adjacent Rohnert Park neighborhoods
- (C) Large, contiguous vacant and underutilized land
- (D) St. Joseph's School Campus
- (E) La Plaza Park Bandstand and site of weekly Farmer's Market
- (F) Cotati Fire Station
- (G) Cotati Creek
- (H) City Hall and Police Station
- (I) Laguna de Santa Rosa Class 1 Bike Path



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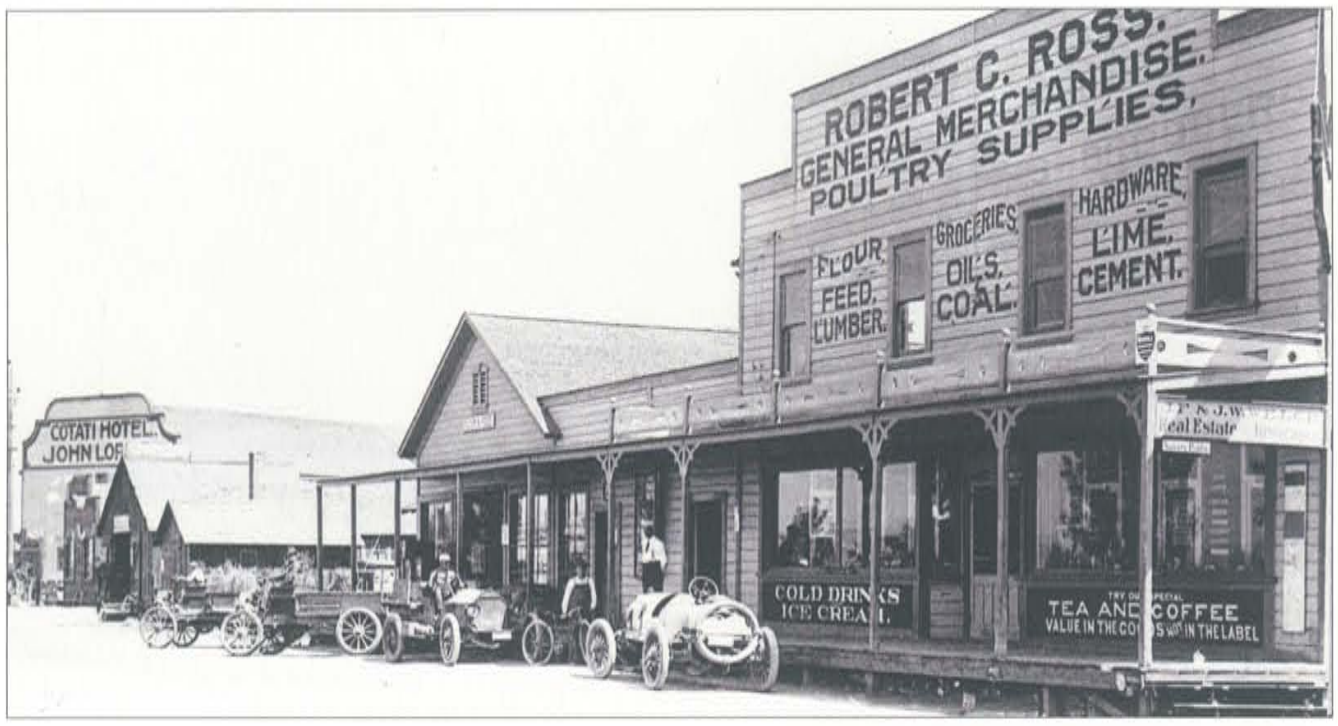
Aerial View of Specific Plan Area - SP Map 2

DOWNTOWN COTATI SPECIFIC PLAN 1:6

August 26, 2009



left:
The Ross Store
circa 1910

1.6 History and Context

The following is a brief chronology of the city's history. Cotati's history is rich and diverse with influence from Native Americans, Spanish and Mexican settlers and Northern European immigrants. Cotati has retained its agricultural roots which began with initial settling of the area and was highlighted by major poultry production during the 1920's. While Cotati has remained relatively small, it aspired to be the site of what is now Sonoma State University and became a city to protect itself from the pace of development activity of neighboring Rohnert Park [1]. Cotati has a proud history of nurturing a sophisticated, yet rustic type of culture known for its tolerance. Below, is a timeline summary of this history.

5,000 years ago: Coast Miwok Indians lived in the Cotate Valley for about 5,000 years until Spanish setllers arrived

1826: English-speaking settlers begin making their homes in the area

1844: Spanish land grant given to Captain Juan Castaneda who later sold the claim to Thomas O. Larkin, the American Consul at Monterey in 1846. Larkin sold the claim in 1849 to Joseph S. Ruckle who sold it two months later to Dr. Thomas Page of Valparaiso, Chile.

1877: Page land grant confirmed by the U.S. District Court for the 17,238-acre land

1892: Cotati Company formed by the Page brothers, Rancho Cotate is surveyed and a hexagonal town plan is established.

1915: State chooses Cotati Blvd as main Highway between Petaluma & Santa Rosa

1944: Page family ownership ends

1955: State moves the highway west to a new freeway: 101, the poultry business becomes unprofitable for small family farms, as major traffic bypasses downtown

1960: Sonoma State College established

1962: Rohnert Park incorporates as a city

1963: Cotati incorporates as a city

1965: Cotati's population is 1,382

1975: Cotati's population reaches 2,860

1980's: Downtown sidewalks installed between La Plaza and Page Street.

1990: Cotati voters adopt urban growth boundary

1991: Traffic signal installed at Old Redwood Hwy/W. Sierra/East Cotati; Bandstand is replaced; Cotati Accordion Festival established

1998: Cotati voters adopt urban growth boundary

2000: Walkable Cotati visioning process is undertaken

2001: Downtown streetscape improvements installed

2005: General Plan Update and Downtown Specific Plan underway. Cotati's population is 7,800.

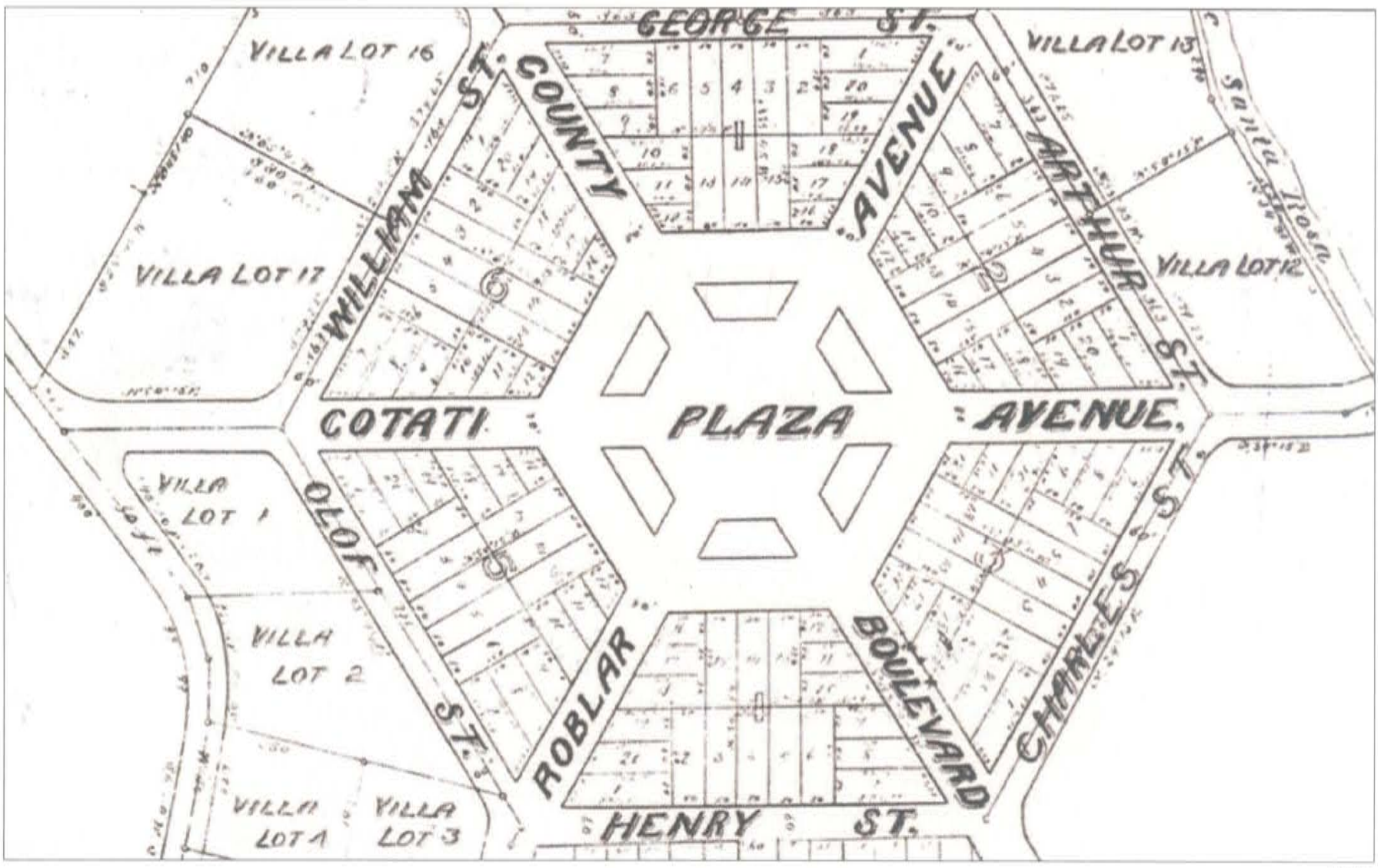
[1] Images of America: Cotati Prudence and Lloyd Draper 2004

La Plaza view north c.1915

The Page Home c. 1895

Cotati countryside c. 1890

below:
Aerial view of hexagon street layout and La Plaza Park from southeast toward the northwest. Historic Downtown can be seen at left with Old Redwood Highway going from left to right diagonally across the photo, circa 1950's



The Hexagon - Platting Map

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above:
Cotati Plaza, circa 1892 identifying the Page family sons' names on the streets forming the hexagon: William, George, Arthur, Charles, Henry and Olof.

County Boulevard would later be renamed 'Old Redwood Highway'' and Roblar Avenue would become West Sierra Avenue and East Sierra Avenue

1.7 Historic Cotati

This chapter is for the purpose of providing an understanding of Cotati's historic context and character. Historic preservation, as a strategy for overall revitalization of Downtown Cotati shall be considered in planning and development actions in the plan area.

Objectives - Through the following, it is possible to provide for sensitive and meaningful adaptive reuse of the plan area's historic resources:

H1 • Respect and celebrate the area's heritage through careful restoration and addition to buildings and sites identified as historically meaningful;

H2 • Provide a meaningful background of historic buildings with which to sensitively complement with new development;

H3 • During the development review process, analyze subject buildings/sites for restoration and reuse strategies and feasible preservation strategies;

H4 • Inventory cultural and historic resources appropriate for restoration and reuse

The following sites and/or buildings have been identified as meaningful and potentially worthy of restoration and adaptive reuse (see map on next page for locations). This list is not intended to be exhaustive.

A. Loyal Cotati Lodge - This Mission style, single-story meeting hall was built in 1911. The building ceased use as a meeting hall in 1957 and was extensively remodeled in 1969 for office uses.

B. St. Joseph's Church - This Italianate style, 150-seat church was built in 1908 and continues in use as the Korean Baptist Church.

C. Frengle Metal Shop - This Mission style commercial building was built in about 1930 by the Frengle family for their metal shop and uses decorative tin metal that simulates stone, a popular technique in this period. The building continues to house retail and service uses.

D. Cotati School (current City Hall) - This site was the location of the previous school building built in 1913 by Penngrove contractor Al Hermann and designed by Petaluma architect Brainerd Jones. The 1913 building was destroyed by fire in 1921 which caused the need to build the current structure in 1922. The building was designed in the Greek Revival style and served as the Cotati school until 1971 when the school district abandoned it for a larger building. Shortly after, the building became Cotati City Hall and is still in use today for the civic and administrative functions of the city.

E. The Congregational Church - This redwood structure was designed in the Gothic Revival style and built in 1907 after the Congregational church outgrew its space in the rear of a local store. Today, the church is known as the Church of the Oaks.

F. Women's Improvement Club - This Craftsman style, single-story building was built in 1909 with additions shortly afterward. The building is in use today as a synagogue.

G. La Plaza - This public space resulted from the 1892 design for the town in the shape of a hexagon per the wishes of the town founder, Thomas Page as communicated to the surveryor and designer, Newton Smyth. This plan is unique in the United States. Over the years, Old Redwood Highway, Cotati Avenue and Sierra Avenue have bisected the plaza to produce 4 individual places within the original plaza space. In 1975, the Plaza was officially recognized as a California State Historic Landmark (SHL 879) and listed on the California Register of Historic Resources.

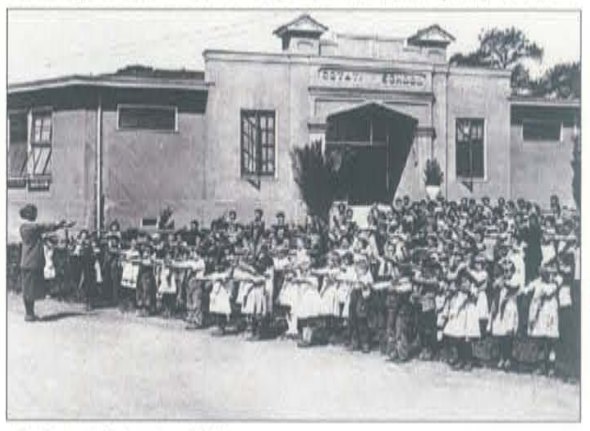
H. Cotati Inn - This building is on the former site of the Cotati Hotel. The Cotati Inn was built in 1932 in response to Redwood Highway becoming the state route through the area. The spanish style architecture is the result of encouragement by the state to design commercial buildings in this style. The building currently houses retail, restaurant and tavern uses.

I. The Ross Home - This Queen Anne (Free Classic) style, 2-story residence was built in 1907 for the Ross family which owned and operated nearby businesses. The building is still used as a residence.

A. Loyal Cotati Lodge Hall c. 1911

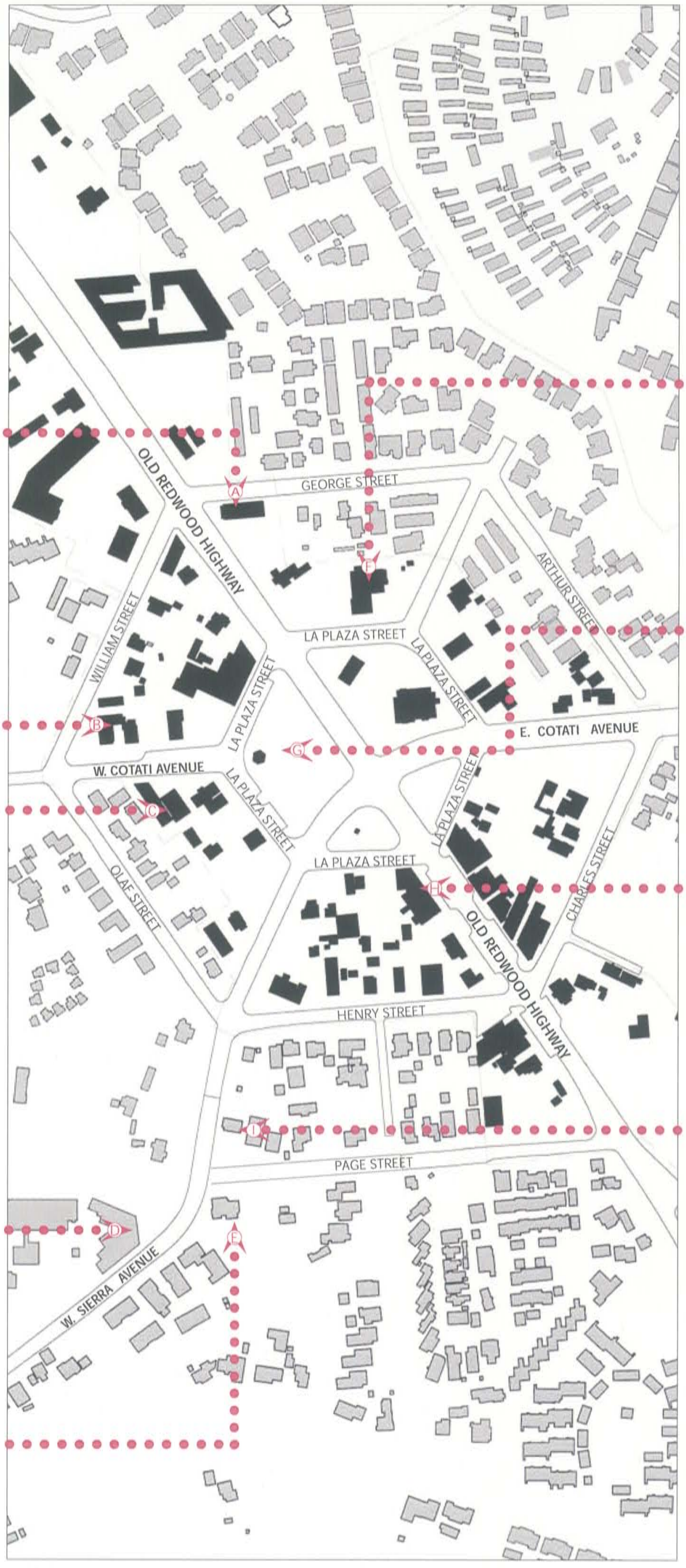
B. St. Joseph's Church c. 1908

C. Frengle Metal Shop c. 1930, also The Hub Cyclery in 1990's



D. Cotati School c. 1922

E. The Congregational Church c. 1907



F. Women's Club c.1909

G. La Plaza view north c.1915

H. Cotati Inn c. 1932

I. The Ross Home c. 1907

Key

Within Specific Plan boundary

Not within Specific Plan boundary

Historic Resources - SP Map 3

DOWNTOWN COTATI SPECIFIC PLAN 1:10

August 26, 2009

1.8 - Public Participation and Plan Preparation

This Plan is the result of an intense public process that involved the community of Cotati through a series of public meetings and a 5-day charrette in July 2005. The evolution of this plan was based on information and confidence gained by the consultants and the community in cooperation as the process unfolded.

The following objectives guided the public participation and plan preparation:

- Engage with the community about downtown's future;
- Involve the community in visioning downtown's future;
- Produce a visionary yet realistic plan that reflect's Cotati's desired future

Previous Plans and Documents - Prior to the preparation of this Specific Plan, the following documents were prepared for the City and were being applied to properties within the boundaries:

Land Use Code
1998 General Plan
2006 General Plan Update Background Report
La Plaza Specific Plan

June - July 2005: Consultant Team Analysis of Downtown and Community - The consultant team visited the community and documented various subjects such as traffic and circulation, building form, architecture, landscape and public realm patterns, drainage patterns, pedestrian access, bicycle access and others. This information was shared among the consultant team in preparation for the charrette.

June 22, 2005: Community Workshop on General Plan / Downtown Specific Plan Members of the overall consultant team facilitated a visioning workshop with the community to identify overall desires, dislikes and comments about the community as a whole and then for the Downtown Plan area. This workshop produced many commonalities in perception and understanding among the participants that provided good direction for City staff and the consultant team. Among the major comments received were the following:

- Strengthen La Plaza Park as a community focal point
- Encourage Mixed-Use Development
- Locate parking behind buildings
- Scale buildings appropriately to positively frame streetscapes
- Avoid homogeneity in building design
- Improve walkability and bicycle circulation
- Encourage small, locally-owned businesses
- Accommodate more night life through entertainment venues and gathering places other than bars

The consultant team then entered the charrette based on this information.

July 17-22, 2005: Charrette Week
With the initial field research and preparation combined with the workshop results, the consultant team worked with City staff to facilitate a 5-day public charrette. The charrette produced several land use and circulation alternatives (see pages 2:3-2:4).

August 16, 2005: Joint Cotati City Council and Planning Commission Meeting- At this public meeting, the consultant team presented the following for review:

- The July 2005 Charrette recommendations
- Form-Based Code to guide future development
- Process for preparing the Specific Plan and Environmental Impact Report

September 28, 2005: Meeting of the Cotati City Council
At this public meeting, the consultant team presented two general pieces of information for review and direction in preparation of the administrative draft Specific Plan:

a) Park Alternatives for resolving the space and regional circulation needs at the existing La Plaza Park,
b) Place-Making Alternatives for the overall plan expressed for each of the four proposed zones within the Plan.

Charrette presentation

Public participation

Community members reviewing historic restoration proposals

Retail consultant Bob Gibbs in one of several progress meetings

City staff and community members in a discussion at one of several progress meetings

Charrette work in progress

Public participation

Charrette work in progress

Consultant team at work

The Charrette Process - This method of public participation brings all interested parties together for 5 days where everyone with a stake or interest of any kind participates directly with the consultant team to develop and review ideas, from their beginning to finalization. This charrette process was selected to allow for greater community input and the sharing of ideas.

The Charrette process is completely interactive and sees each of the design components developed simultaneously in response to issues and needs posed by participants. City staff are involved throughout and help facilitate participation from a person or group that needs to provide input on a particular subject. In addition, focus sessions are held throughout the day with particular groups such as a Merchant's Association, property and business owners, Historical Society, Chamber of Commerce and sometimes private parties that have pending developments in the area that might be affected or benefit from the Plan. In this way, the 'feedback' loops are ongoing and immediate. At the end of each 10-hour day, the consultant team summarizes what the consultant team, City staff and the participants studied, achieved and decided that day for the community's review and comment. Through this highly visual and interactive process, participants have the opportunity to become aware of and help shape the direction and intent of the evolving Plan that is based on clear, physical and desired outcomes.

Below is a summary of the charrette schedule for July 17-22, 2005.

Sunday, July 17
Ice Cream social with City Council, Planning Commission, Design Review Committee, staff and the community to review the week's objectives and the process.

Day 1: Monday, July 18
Vision and Frameworks with public briefing on traffic and parking
Community Presentation 1

Day 2: Tuesday, July 19
Design Development / Refinement / Evaluation with public briefing on retail
Community Presentation 2

Day 3: Wednesday, July 20
Design Refinement / Preliminary Code / Implementation / Evaluation with public briefing on economic development
Community Presentation 3

Day 4: Thursday, July 21
Design/Code Summation / Implementation / Final Evening Presentation

Day 5: Friday, July 22
Open House and Design Team Summation

Charrette presentation

Cotati charrette design team

Cotati charrette cookies

1.9 - Plan-Wide Policies

Conventional suburban development is the form of growth which has produced large-scale sprawl throughout California over the last fifty years. Sprawl development is characterized by homogeneous single-use zones, with the housing tract, the shopping center and the business park as its basic elements. These segregated use areas are connected by a discontinuous system of wide thoroughfares designed for the rapid movement of cars.

As a clear departure from conventional suburban practices, this Specific Plan works in every way to recognize traditional neighborhood development and enable it through appropriate vision, policies and regulations. The best physical patterns that exist in Cotati are maintained and reinforced over time. This Plan is based on a set of integrated principles that have produced the best places in both Cotati and and other cities throughout the world. These are adapted to the task of directing the growth of downtown to successfully serve the city over the long-term. The principles are summarized into seven policies identified on these two pages. These policies shall guide development decision-making pursuant to this plan.

Square framed and activated by buildings and their individual activities

Paseo connecting parking to stores

Connections to and through parks

SP1 **Ensure that public open space is integrated into the Downtown: Make Great Public Places**
The highlight of a downtown's public life is its center. Its civic buildings enhance community identity and foster civic pride. Its shops and workplaces provide convenient access to goods and services without need for a car trip. These public places are the visual puncutations along the greater public realm of streets that give access and identity to the community and Downtown. A set of great public places that serve the greater Downtown and the focused areas within it, will distinguish Downtown Cotati from other towns and contribute to its unique and genuine character.

Paseos providing additional business opportunities while appropriately activating the public realm

Great mixed-use street: 1-3 stories, wide sidewalks, on-street parking, shade

Great neighborhood street

Great retail street

SP2 **Ensure that streets are designed to be multi-modal: Make Great Streets**
Street design dictates the form of individual blocks and buildings that enclose each streetscape. Downtowns are structured on individual blocks and a network of interconnected thoroughfares, which encourage pedestrian movement. This network provides multiple routes that diffuse traffic, increasing the options for people to walk and bike to various destinations and for emergency access. Streets of varying types, or primary purpose (e.g., main street, parkway, residential street), provide equally for pedestrian comfort, bicycle safety and for automobile movement according to their location and necessary function in the overall plan. Where needed, streets have landscaped center medians, to reduce apparent street width. Finally, where possible, streets have on-street parking in order to provide a buffer between the moving traffic and the pedestrian, thus diminishing perceived and actual danger.

Apartments over Main Street stores

Flats and Lofts over commercial

Lofts over Main Street stores

SP3 **Ensure that vertical mixed-use is the primary focus of development within the downtown: Live Above Stores**
A downtown is a district defined by the same general qualities as a neighborhood, with one major exception: commercial activities predominate instead of residential. Yet, the quality and amount of housing in a downtown determine its particular character. Townhouses, lofts or flats allow for a variety of households to live near diverse services, while providing a constant 24/7 rhythm of use.

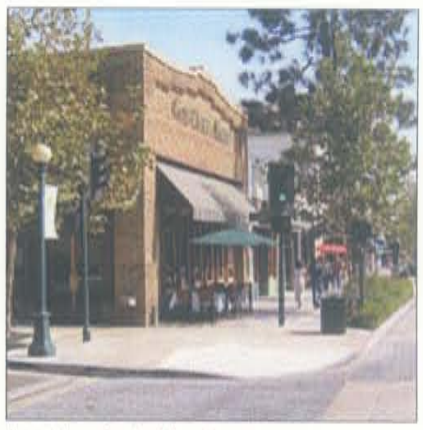
SP4 **Ensure variety of building types, styles and sizes are constructed within downtown: Build a Variety of Buildings**

The buildings, blocks and streets of a Downtown are interdependent while contributing to an overall pattern of unique and related places. Each one contains in part the ingredients of all the others. Buildings of a particular quality can define the block that contains them and the street that surrounds them. Design is the matrix that helps either to create or destroy the quality and character of a place. Buildings are the smallest increment of growth. A variety of architectural types and their relationship to each other, largely determine the character of a downtown as they define the streets and open spaces they face.

Contemporary architecture

Buildings responding to climate

Simple, pedestrian friendly sidewalks



Locally-oriented businesses

Regionally-oriented businesses

Traditional architecture

SP5

Ensure a mix of housing types to serve all economic segments of the community: Create a Variety of Housing Choices

As a downtown matures and its livability and economic value increase, a more diverse set of housing choices attract an increasingly varied resident population housed in rental or ownership configurations. The variety is necessary for vitality over the long-term and is enabled by the various building types and blocks in the Plan.

Granny flat on an alley

Townhouses

Courtyard Housing

Lofts and flats over stores

Parking as active, urban building

Liner building transitioning to sidewalk

Attractive and clear signage

SP6 **Ensure a mix of retail uses configured to facilitate pedestrian storefront shopping: Get the Retail Right**

The retail industry has recently discovered that outdoor, Main Street-type retail fits the lifestyle of busy consumers, often yielding more regular trips and higher sales volumes than standard shopping centers. Retailers are therefore, encouraged to facilitate pedestrian storefront shopping. The retail core of transitional downtowns is typically located around a pattern of streets accommodating cars and on-street parking. Off-street parking is located in shared, Park-Once lots or structures, convenient but compatible to the scale of a Main Street. The retail core typically includes at least one anchor tenant, and a mix of vendors to broaden its appeal and success over the long-term while capturing vehicle trips that would othewise generate more vehicle miles.

SP7 **Ensure sufficient parking for all uses within the plan area with emphasis upon an appropriate combination of on- and off-street parking: Get the Parking Right**

The typical suburban, sequential pattern of "shop and park" requires two movements and a parking space to be dedicated for each visit to a shop, office, or civic institution. For three tasks, this requires six movements and three parking spaces. By contrast, the compactness, mixed-use nature and walkability of a mixed-use environment lends itself to moving twice, parking just once, and completing multiple daily tasks on foot. This principle, 'park-once', reduces the average trip load and parking in a traditional downtown by half over strip retail. The transformation of drivers into walkers is the immediate generator of pedestrian life: crowds of people that animate public life in the streets and generate the patrons of street-friendly retail businesses. It is this "scene" created by pedestrians in appropriate numbers, that provides the energy and attraction to sustain a thriving Main Street environment.

1.10 - Strategy for Revitalization

1.10.010 - Objectives by District

In concert with the following statements about emphasis and objectives, the diagram at right illustrates the twenty plan-wide objectives that carry forward the six goals and seven plan-wide policies that drive this plan. The following objectives are represented through the various actions described on the following pages. Accordingly, this policy-level information informs the vision, programs, implementaiton measures and development regulations that will carry out the plan over its 20-year planning horizon.

District (Place) and Emphasis

1. Commerce Avenue: 6.5 acres [a] — CA

a. **Revenue-Generation** - The purpose of this area of the plan is to capitalize on its key exposure and access to US 101 for community-wide service and retail opportunities. While not large in area, this area is best-suited for such activity and revenue-generation in support of the larger plan area.

Objectives

CA-1. Improve circulation and provide civic identity at intersection of Gravenstein and Old Redwood Highway.

CA-2. Define and unify streetscape in support of highway retail.

2. Northern Gateway: 36.2 acres [a] — NG

a. **Regeneration** - This area of the plan represents the potential for several new blocks of housing, commercial and civic development supported by a new network of open spaces and streets. Such regeneration of an infill area provides for growth without the need to extend the City's boundaries by using what is currently underutilized and vacant land.

b. **Revenue-Generation** - To facilitate development of key improvements identified throughout the plan, it is necessary to generate revenue with which to offset those expenditures. This area of the plan presents the largest contiguous opportunity for a substantial revenue stream for such efforts. Through anticipated tax increment revenue to the Cotati Community Redevelopment Agency, the Agency's limited bonding capacity is increased. The additional value for the plan area can also support a variety of financing strategies such as assessment districts, business improvement districts, transportation improvement districts, etc, to be determined by the City.

Objectives

NG-1. Transform underutilized land into mixed-use district.

NG-2. Reconfigure Old Redwood Highway into a vibrant, mixed use, multi-modal and beautiful urban street.

NG-3. Provide a variety of open space.

NG-4. Provide a variety of housing.

NG-5. Provide pedestrian-oriented retail in mixed-use buildings.

NG-6. Require 'park-once' system of shared parking.

3. La Plaza Park: 11.3 acres [a] — LP

a. **Civic Identity** - The reconfiguration of this important place in Cotati is of vital long-term interest to the community. La Plaza Park elegantly addresses local and regional circulation needs while enhancing a genuinely memorable place. The enhanced setting for community events as well as for the individual buildings and properties that line its edges catalyzes activity due to the strength of place and identity of the new park.

Objectives

LP-1. Maintain La Plaza Park as the civic focus for Cotati.

LP-2. Plan development and infrastructure to accommodate a unified La Plaza Park

LP-3. Over time, as financing and development allow, reconfigure La Plaza Park to maximize and enhance use.

LP-4. Accommodate community-wide circulation while maintaining the village-scale context of the La Plaza Park area.

LP-5. Enhance bicycle and pedestrian circulation and access.

LP-6. Reactivate the hub with housing & office over commercial

LP-7. Enhance public parking

4. Historic Core: 5.5 acres [a] — HC

a. **Renovations and Restoration** - Fundamental to the success of the revitaliztion efforts is the subject of working within the existing physical conditions of the historic character of downtown. Priority needs to be given to projects that restore historic buildings by removing existing, inconsistent, elements/renovations or by renovating compromised buildings to their former visual integrity. This is critical because it signals commitment to maintain Cotati's character prior to, or simultaneously with, pursuing new development. Future actions or development projects are then measured against the success of restoration and renovation of the historic core.

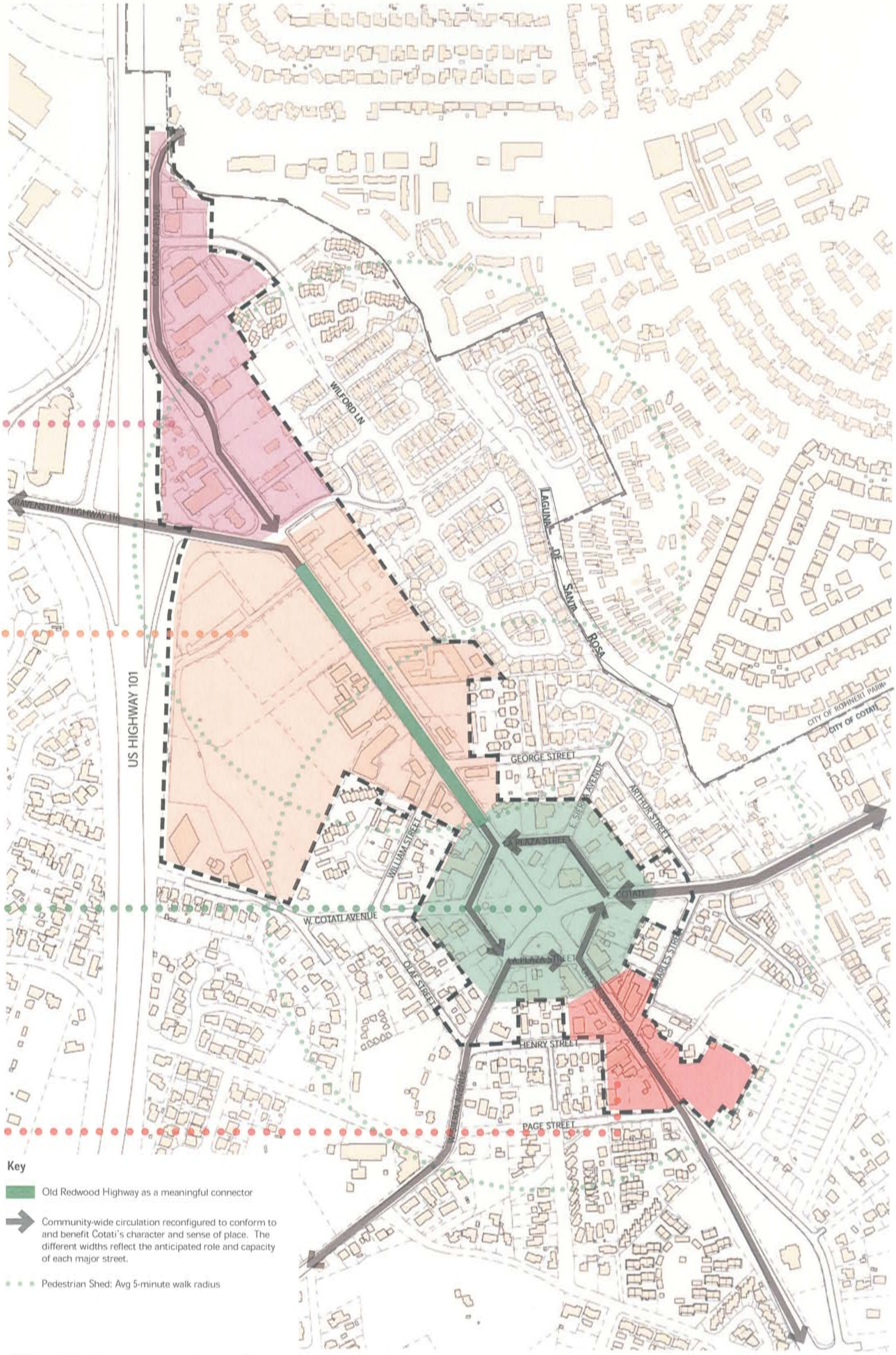
Objectives

HC-1. Require restoration or renovation of federally, state or locally designated historic buildings to the maximum feasible extent.

HC-2. Enhance public parking.

HC-3. Enhance bicycle and pedestrian circulation and access.

[a] Total 59.5 acres: Net developable area = 54-acre plan area (exclusive of R.O.W.)



Revitalization Strategy - SP Map 4

DOWNTOWN COTATI SPECIFIC PLAN 1:16

August 26, 2009

1.10 - Strategy for Revitalization

In response to the preceding goals, policies and objectives for the districts, and in light of the plan-area's constraints and opportunities, the following programs are set forth.

1.10.020 - Plan-Wide Programs

To initiate revitalization, the following programs carry forward the direction of the goals, policies and objectives to facilitate implementation of this plan. These actions set the overall tone to stimulate investment from the widest variety of perspectives and interests.

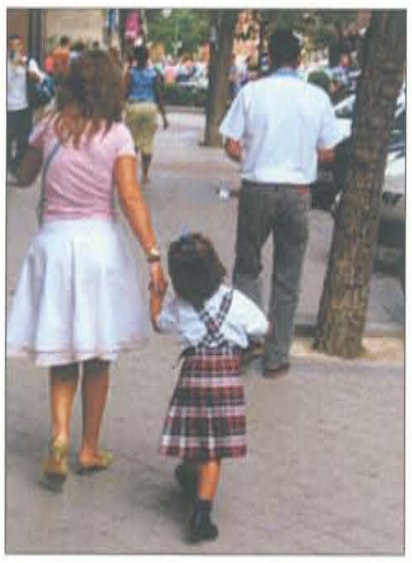
Mobility and Transit - The balance between accommodating regional and community-wide circulation through the heart of Cotati and maintaining Cotati's character and sense of place needs to be restored. Further, the existing circulation system needs to be made as continuous as possible, providing multiple routes as well as enhancements to bus service.

- **Reclaim the heart of Cotati for more than traffic circulation** - This can be accomplished through the following:

1. Maintain low traffic speeds throughout the plan area that reinforce the area's historic and pedestrian-oriented context (e.g., relationship of buildings to street, smaller curb radii, streetscape, etc). The design and ultimate construction of all new and modified streets in the plan area are to reflect the area's village-scale context and the intrinsic need to also accommodate cyclists and pedestrians.

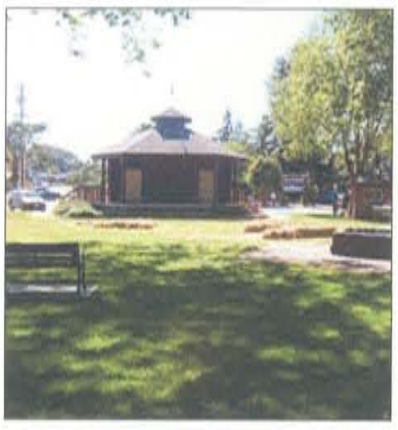
2. Reconfigure Old Redwood Highway so that it becomes the northern counterpart to the established and visible southern half of Downtown Cotati, setting the stage for pedestrian-focused development. Through its transformation into an important and beautiful urban parkway with lush landscape and pedestrian-oriented frontages, this road will catalyze numerous private development actions along its new edges.

3. Complete or add to, as appropriate, the circulation system to enable bicycle and pedestrian circulation.



Top Row:
Several gaps in the streetscape and pedestrian or bicycle access need to be completed appropriately to encourage alternative modes to the automobile on a plan-wide basis (above).

Right and Far Right:
The current bisecting of La Plaza Park into 4 pieces that do not operate coherently as a whole needs to be reversed by reclaiming the pieces into one and responsibly directing traffic around the hexagonal park.



Historic Preservation - Preserving and reinforcing the prevalent historic and pedestrian nature of downtown is fundamental to successful revitalization.

- **Provide purpose and motivation for restoration/renovation** - The benefits of making such investments need to be conveyed and facilitated for maximum positive effect to the plan area and community. This can be accomplished through the following:

4. Inventory all cultural and historic resources within the plan area to appropriately inform near and long-term actions/investment.

5. Enable the combination of historic preservation and new development.

Left and Above:
Buildings such as these exist in a dispersed pattern that generally focuses around the La Plaza Park area of the plan. The range of need varies from the removal of inconsistent elements (e.g., signage, aluminum windows) and poorly executed additions, to the lack of streetscape and connection to the public realm(top right).

Simultaneous with other actions throughout the plan area, the careful restoration and/or renovation of such resources needs to occur for the long-term benefit of Downtown cotati.

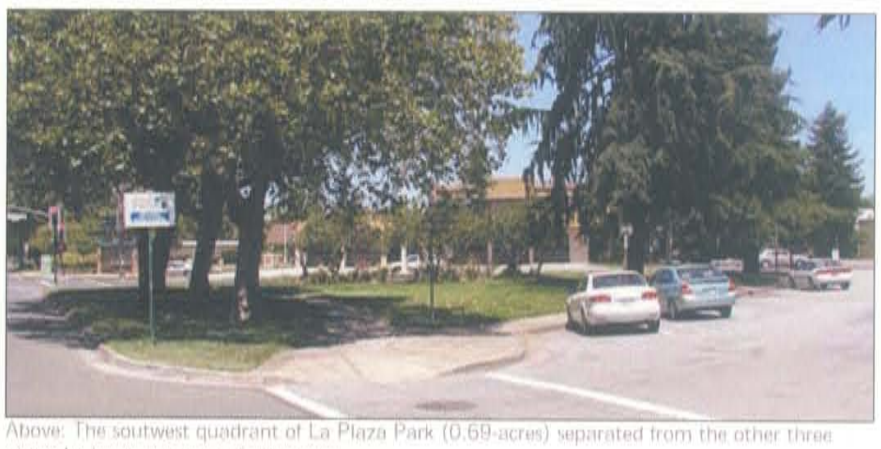
Civic Features - The factor that will leverage downtown into a community-wide and regional feature is the inclusion of civic buildings and activities.

- **Enhance and/or generate civic space** - The very presence of civic activity is what distinguishes a place from just another collection of stores and restaurants. For Downtown Cotati to be a true community focus, civic space needs to be enhanced and generated in a variety of sizes and locations through the following:

6. Ensure that new development areas provide genuine and varied civic space and/or uses, particularly in the northern planning area where there is a great imbalance of open space (left and below left).

7. Promote and expand downtown festivals and events.

8. Enhance La Plaza Park as the community focus for civic activity in Cotati.



Above: The soutwest quadrant of La Plaza Park (0.69-acres) separated from the other three pieces by large amounts of pavement.

Shared Parking- The idea of parking as a utility or as infrastructure that is shared in the same way as a street or water service, is fundamental to enabling the intimate types of places envisioned by this Specific Plan.

- **Public Parking -** To create the reason for walking or visiting more than one destination, it is necessary to free non-residential projects from providing their required parking on site. In this way, motorists are transformed into pedestrians to maximize each site and by extension, to benefit the entire plan area. This action can be accomplished through the following:

9. Reward retail and restaurant activity in mixed use environments through lower parking requirements, including shared parking (park-once).

10. Provide a variety of shared parking through a balanced approach of on-street and off-street lots or garages strategically dispersed for maximum effect.

Above:
The strategic and efficient distribution of shared parking ('park once') leverages what is often a burden into a resource that can actually produce real estate as shown above in the "liner" building concealing a public, shared garage (left). The Park-Once approach combines shared on and off-street parking to liberate private property from having to consume itself with parking.

Housing - There is an increasing demand for housing in the area to serve a diverse set of needs.

- **Leverage the demand for housing into an asset for both downtown and the community.** - This can be accomplished through the following:

11. Ensure a wide variety of housing types and unit types into the various buildings throughout the plan area.

12. Provide a variety of housing choices within the smallest scale of development: the building

Above:
A variety of building types and unit types assembled to generate diverse and context-responsive living environments

The Public Realm - For the various blocks, buildings, housing and businesses to operate cohesively, it is necessary to consider the public realm as the community framework which unites and maximizes the individual elements.

- **Enhance and complete the public realm** -The needs of cars must be balanced with those of pedestrians and cyclists to achieve an appealing and coherent village-scale downtown. This can be accomplished through the following:

13. Enhance or complete streetscapes as appropriate;

14. Treat streetscapes as multi-modal, flexible and practical;

15. Require high design quality in buildings to help shape the public realm.

Left and Below:
Lodging of a village-scale that is urban in nature provides visitors with direct access to the amenity that is Downtown without having to leave the area.

Bottom Row:
All streetscapes need to be intentional and inviting to provide residents and visitors alike with a reason to walk and for businesses to respond accordingly.

Sustainable-Building Practices While the act of revitalizing the village-scale and urbanism of downtown is sustainable, the buildings that ultimately generate the place must also contribute to the quality of the local natural environment.

- **Incentivize Best Practices -** The benefits of successful examples need to be documented and published for further use through the following:

16. Provide applicants with information about sources and performance of green-building products/techniques.

17. Provide examples of executed green-buildings for reference.

18. Require all development within the plan area to comply with media campaign on Cotati's sustainable building program.

Left:
Cotati established green-building requirements in 2005 and has working-experience to leverage further sustainable investment.

Lodging - Cotati lacks lodging accommodations and as a result, defers such business to neighboring communities along with the associated restaurant and retail revenue.

- **Capture sales and hotel taxes -** A hotel(s) that is urban in nature, fitting into the historic character and pedestrian-oriented pattern of the area will benefit and add needed depth to downtown through the following:

19. Encourage hotel development in the Northern Gateway which is pedestrian-oriented and has active ground floor uses and facades.

20. Leverage hotel(s) activity through immediate proximity to village-scale retail and services.